Cover Sheet **Form CS**

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
04/03/07

Please see instructions on page 2 before filling out the form.

DEQ USE ONLY
Date Received
RECEIVED MAY 09 2008 Department of Environmental Quality State Air Program
Project Number
Payment / Fees Included? Yes ☐ No ☐
Check Number

COMPANY NAME, FACILITY NAME, AND FACILITY ID NUMBER

1. Company Name	Owen PC Construction LLC	
2. Facility Name	1580 Hotplant	3. Facility ID No.
4. Brief Project Description - One sentence or less	Permit existing portable asphalt drum mixer.	

PERMIT APPLICATION TYPE

5. ☒ New Facility ☐ New Source at Existing Facility ☐ Unpermitted Existing Source
☐ Modify Existing Source: Permit No.:_____ Date Issued:_____
☐ Required by Enforcement Action: Case No.:_____

6. ☒ Minor PTC ☐ Major PTC

FORMS INCLUDED

Included	N/A	Forms	DEQ Verify
☒	☐	Form GI – Facility Information	☐
☒	☐	Form EU0 – Emissions Units General	☐
☒	☐	Form EU1 - Industrial Engine Information Please Specify number of forms attached: _____	☐
☐	☒	Form EU2 - Nonmetallic Mineral Processing Plants Please Specify number of forms attached: _____	☐
☐	☒	Form EU3 - Spray Paint Booth Information Please Specify number of forms attached: _____	☐
☐	☒	Form EU4 - Cooling Tower Information Please Specify number of forms attached: _____	☐
☐	☒	Form EU5 – Boiler Information Please Specify number of forms attached: _____	☐
☒	☐	Form HMAP – Hot Mix Asphalt Plant Please Specify number of forms attached: _____	☐
☐	☒	Form CBP - Concrete Batch Plant Please Specify number of forms attached: _____	☐
☐	☒	Form BCE - Baghouses Control Equipment	☐
☒	☐	Form SCE - Scrubbers Control Equipment	☐
☒	☐	Forms EI-CP1 - EI-CP4 - Emissions Inventory– criteria pollutants (Excel workbook, all 4 worksheets)	☐
☒	☐	PP – Plot Plan	☐
☐	☒	Forms MI1 – MI4 – Modeling (Excel workbook, all 4 worksheets)	☐
☒	☐	Form FRA – Federal Regulation Applicability	☐

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
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PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/26/07

Please see instructions on page 2 before filling out the form.

All information is required. If information is missing, the application will not be processed.

IDENTIFICATION	
1. Company Name	Owen PC Construction LLC
2. Facility Name (if different than #1)	1580 Hotplant
3. Facility I.D. No.	
4. Brief Project Description:	Permit existing portable asphalt drum mixer.
FACILITY INFORMATION	
5. Owned/operated by: (√ if applicable)	☐ Federal government ☐ County government ☐ State government ☐ City government
6. Primary Facility Permit Contact Person/Title	Voyd Stewart, Vice President
7. Telephone Number and Email Address	208-787-6936, voyd@owen-pc.com
8. Alternate Facility Contact Person/Title	David Owen, President
9. Telephone Number and Email Address	208-787-6936, david@owen-pc.com
10. Address to which permit should be sent	P.O. Box 1077
11. City/State/Zip	Victor, Idaho 83455
12. Equipment Location Address (if different than #10)	185 East 25 North
13. City/State/Zip	Driggs, Idaho 83422
14. Is the Equipment Portable?	☒ Yes ☐ No
15. SIC Code(s) and NAISC Code	Primary SIC: 2951 Secondary SIC (if any): NAICS: 324121
16. Brief Business Description and Principal Product	Portable Asphalt drum mixer to produce asphalt for use in paving streets, parking lots and etc.
17. Identify any adjacent or contiguous facility that this company owns and/or operates	Rock Crusher
PERMIT APPLICATION TYPE	
18. Specify Reason for Application	☒ New Facility ☐ New Source at Existing Facility ☐ Unpermitted Existing Source ☐ Modify Existing Source: Permit No.:____ Date Issued: ____ ☐ Permit Revision ☐ Required by Enforcement Action: Case No.:____
CERTIFICATION	
IN ACCORDANCE WITH IDAPA 58.01.01.123 (RULES FOR THE CONTROL OF AIR POLLUTION IN IDAHO), I CERTIFY BASED ON INFORMATION AND BELIEF FORMED AFTER REASONABLE INQUIRY, THE STATEMENTS AND INFORMATION IN THE DOCUMENT ARE TRUE, ACCURATE, AND COMPLETE.	
19. Responsible Official's Name/Title	Voyd Stewart, Vice President
20. RESPONSIBLE OFFICIAL SIGNATURE	Voyd Stewart Date: 5-6-08
21. ☒ Check here to indicate you would like to review a draft permit prior to final issuance.	

Emissions Unit - General **Form EU0**

DEQ AIR QUALITY PROGRAM
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PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/27/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
Company Name: Owen PC Construction LLC	Facility Name: 1580 Hotplant	Facility ID No:
Brief Project Description:	Permit existing portable asphalt drum mixer.	

EMISSIONS UNIT (PROCESS) IDENTIFICATION & DESCRIPTION	
1. Emissions Unit (EU) Name:	1580 HOTPLANT
2. EU ID Number:	1
3. EU Type:	☒ New Source ☐ Unpermitted Existing Source ☐ Modification to a Permitted Source -- Previous Permit #: Date Issued:
4. Manufacturer:	CMI
5. Model:	UDM 1200
6. Maximum Capacity:	250 T/P/H
7. Date of Construction:	1979
8. Date of Modification (if any)	
9. Is this a Controlled Emission Unit?	☐ No ☒ Yes If Yes, complete the following section. If No, go to line 18.

EMISSIONS CONTROL EQUIPMENT						
10. Control Equipment Name and ID:	Wet Scrubber					
11. Date of Installation:	1979	12. Date of Modification (if any):				
13. Manufacturer and Model Number:	CMI UDM 1200					
14. ID(s) of Emission Unit Controlled:	1580 Hotplant					
15. Is operating schedule different than emission units(s) involved?	☐ Yes ☒ No					
16. Does the manufacturer guarantee the control efficiency of the control equipment?	☐ Yes ☒ No (If Yes, attach and label manufacturer guarantee)					
	Pollutant Controlled					
	PM	PM10	SO_2	NOx	VOC	CO
Control Efficiency	See attached Sheet and Stack Test					
17. If manufacturer's data is not available, attach a separate sheet of paper to provide the control equipment design specifications and performance data to support the above mentioned control efficiency. see attached						

EMISSION UNIT OPERATING SCHEDULE (hours/day, hours/year, or other)	
18. Actual Operation	600-1000 HOURS/YEAR
19. Maximum Operation	2200 HOURS/YEAR

REQUESTED LIMITS	
20. Are you requesting any permit limits?	☐ Yes ☒ No (If Yes, check all that apply below)
☐ Operation Hour Limit(s):	
☐ Production Limit(s):	
☐ Material Usage Limit(s):	
☐ Limits Based on Stack Testing	Please attach all relevant stack testing summary reports
☐ Other:	
21. Rationale for Requesting the Limit(s):	

Emission Inventory

Source	Tons/Year TSP	PM-10	NOX	VOC	CO	SOX
CMI Drum Dryer	2.28	1.83	6.88	4.68	93.50	1.38
Elevator, Sceens, Bins, and Mixer	55.00	8.25				
Cold Aggregate Handling	27.50	11.00				
Diesel Generator (600 KW)	0.47	0.31	20.37	0.63	4.66	2.65
Haul Roads	15.00	6.75				
Total	100.26	28.13	27.25	5.30	98.16	4.02

CMI Drum Dryer

Maximum Process Rate: 250 tons/hr (MAXIMUM DESIGN)
Process Airflow Rate: 6050 dscf/min
Hours of operation: 2200 hr/yr
TSP Emissions

Emission Factor: 0.04 gr/dscf
Calculations: 0.04 gr/dscf * 6050 dscf/min * 1lb/7000gr * 60 min/hr = 2.07 lbs/hr
2.07 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 2.28 tons/yr

PM-10 Emissions:

Emission Factor: 0.032 gr/dscf (80% of TSP is PM-10 from AP-42, Table 8.1-2, 10/86)
Calculations: 0.032 gr/dscf * 6050 dscf/min * 1lb/7000gr * 60 min = 1.66 lbs/hr
1.66 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 1.83 tons/yr

NOx Emissions:

Emission Factor: 0.025 lbs/ton (AP-42, Table 11.1-8)
Calculations: 0.025 lbs/ton * 250 tons/hr = 6.25 lbs/hr
6.25 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 6.88 tons/yr

VOC Emissions:

Emission Factor: 0.017 lbs/ton (AP-42, Table 11.1-8)
Calculations: 0.017 lbs/ton * 250 tons/hr = 4.25 lbs/hr
4.25 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 4.68 tons/yr

CO Emissions:

Emission Factor: 0.34 lbs/ton (AP-42, Table 11.1-8)
Calculations: 0.340 lbs/ton * 250 tons/hr = 85.00 lbs/hr
85.00 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 93.50 tons/yr

SOx Emissions:

Emission Factor: 0.005 lbs/ton (AP-42, Table 11.1-8)
Calculations: 0.005 lbs/ton * 250 tons/hr = 1.25 lbs/hr
1.25 lbs/hr * 2200 hr/yr*0.0005 tons/lb = 1.38 tons/yr

Emissions Units - Industrial Engine Information **Form EU1**

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PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/27/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
Company Name: Owen PC Construction LLC	Facility Name: 1580 Hotplant	Facility ID No:
Brief Project Description:	Permit existing portable asphalt drum mixer.	

EXEMPTION

Please refer to IDAPA 58.01.01.222.01.c and d for a list of internal combustion engines that are exempt from the Permit to Construct requirements.

ENGINE (EMISSION UNIT) DESCRIPTION AND SPECIFICATIONS

1. Type of Unit: ☒ New Unit ☐ Unpermitted Existing Unit ☐ Modification to a Unit with Permit #: Date Issued:

2. Use of Engine: ☒ Normal Operation ☐ Emergency ☐ Back-up ☐ Other:

3. Engine ID Number:	4. Rated Power:	
BPG02595	☐ Brake Horsepower(bhp) ☒ 545 Kilowatts(kW)	
5. Construction Date:	6. Manufacturer: Caterpillar	7. Model: 3412CDITA
8. Date of Modification (if applicable):	9. Serial Number (if available):	10. Control Device (if any):

FUEL DESCRIPTION AND SPECIFICATIONS

11. Fuel Type	☒ Diesel Fuel (#) (gal/hr)	☐ Gasoline Fuel (gal/hr)	☐ Natural Gas (cf/hr)	☐ Other Fuels (unit:)
12. Full Load Consumption Rate	41.8			
13. Actual Consumption Rate	30.8			
14. Sulfur Content wt%	9 PPM/MAX	N/A	N/A	

OPERATING LIMITS & SCHEDULE

15. Imposed Operating Limits (hours/year, or gallons fuel/year, etc.):
2200 HOURS/YEAR

16. Operating Schedule (hours/day, months/year, etc.):
12 HOURS/DAY, 7 MONTHS/YEAR

Hot Mix Asphalt Plant **Form HMAP**

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
04/02/07

Please see instructions on page 4 before filling out the form.

GENERAL INFORMATION

Company Name:	Owen PC Construction LLC		
Facility Name:	1580 Hotplant	**Facility ID No:**	
Brief Project Description:	Portable asphalt drum mixer.		
Mailing Address:	P.O. Box 1077		
City:	Victor	**State:**	Idaho
Zip Code:	83455	**County:**	Teton
General Nature of Business & Products:	General Contractor - Gravel, Asphalt, etc.		

Contact Name, Title:	Voyd Stewart, Vice President		
Phone:	208-787-6936	**Cell:**	307-413-1142
Email:	voyd@owen-pc.com		

Owner or Responsible Official Name, Title:	Voyd Stewart, Vice President
Phone:	208-787-6936
Email:	voyd@owen-pc.com

Proposed Initial Plant Location:	185 East 25 North		
Nearest City:	Driggs	**Estimated Startup Date:**	June 15,2008
County:	Teton		

Reason for Application:	☒ Permit to construct a new source ☐ Permit to operate an existing unpermitted source ☐ Permit to modify/revise an existing permitted source (identify the permit below) Permit No.: _____ Issue Date: _____ Facility ID: _____

☒ Check here to indicate you would like to review a draft permit prior to final issuance.

Comments: The plant has previously been permitted in the state of Kansas. The Kansas Department of Health and Environment source ID number is 7770060.

HOT-MIX ASPHALT PLANT INFORMATION

Manufacturer:	CMI	**Model:**	UDM 1200
Manufacture Date:	1979	**Type HMA Plant:**	☒ Drum Mix ☐ Batch Mix
Maximum Hourly Asphalt Production:	250 (tons/hour)		
Requested Annual Asphalt Production:	200,000 (tons/year)		
Burner Fuel Type:	#2 fuel oil or used oil (natural gas, #2 fuel oil, used oil, etc.)		
Maximum Burner Fuel Usage Rate:	300 ☐ scf/hour or ☒ gallons/hour		
Type Air Pollution Control Device:	Scrubber (baghouse, scrubber, etc.)		
Control Device Manufacturer:	CMI	**Model:**	UDM 1200
Stack Parameters:	Stack Height from Ground (ft): 20	Stack Exhaust Flow Rate (acfm):	6050
	Stack Inside Diameter (ft): 2.6	Stack Exhaust Gas Temperature (°F):	340

ASPHALT TANK HEATER

Fuel Type:	#2 fuel oil (natural gas, #2 fuel oil, used oil, etc.)		
Maximum Fuel Usage Rate:	8 (units/hour) (units/year) ☒ gallons ☐ ft^3 ☐ other:		
Type Air Pollution Control Device:	☐ MMBtu ☐ HP		
Stack Parameters:	Stack Height from Ground (ft): 12	Stack Exhaust Flow Rate (acfm):	?
	Stack Inside Diameter (ft): .67	Stack Exhaust Gas Temperature (°F):	350

Is this an NSPS-affected facility? ☒ Yes ☐ No

To determine if the HMA facility is a New Source Performance Standards (NSPS)-affected facility, consider the following:

Were any of the following constructed or modified after June 11, 1973, such that the equipment becomes an affected facility as defined in 40 Code of Federal Regulations, Part 60, Section 90 (40 CFR 60.90) *Standards of Performance for Hot-Mix Asphalt Facilities*:

- Dryers
- Systems for screening, handling, storing, and weighing of hot aggregate
- Systems for loading, transferring, and storing of mineral filler
- Systems for mixing hot-mix asphalt
- Leading, transfer, and storage systems associated with emission control systems

Modification is defined in 40 CFR 60.14. The Code of Federal Regulations can be accessed from the website http://www.gpoaccess.gov/cfr/.

Has a performance test been conducted in accordance with 40 CFR 60.93 that demonstrates particulate matter emissions are less than or equal to 0.04 gr/dscf (grains per dry standard cubic foot) at the HMA stack?

☒ Yes ☐ No

If Yes, state the date the test was conducted: June 26, 1986

Provide a copy of the performance test results with this application if you want DEQ to consider it in determining the frequency of performance testing requirements for your hot-mix asphalt plant.

ELECTRICAL GENERATOR SET INFORMATION (If Applicable)

Manufacturer:	Caterpillar	**Model:**	545kw
Maximum Rated Capacity:	545 ☐ Hp	☒ kW	
Fuel Type:	☐ Gasoline	☒ Diesel	☐ Natural Gas ☐ Propane
Maximum Fuel Usage Rate:	40 ☒ gal./hr.	☐ cfh	
Maximum Daily Hrs. of Operations:	12 (hours/day)		
Maximum Annual Hrs. of Operations:	2200 (hours/year)		
Stack Parameters:	Stack Height from Ground (ft): 12	Stack Exhaust Flow Rate (acfm):	134 m3/min
	Stack Inside Diameter (ft): .833	Stack Exhaust Gas Temperature (°F):	505.5 Deg C

Manufacturer:	Whisper Watt	**Model:**	45kw
Maximum Rated Capacity:	45 ☐ Hp	☒ kW	
Fuel Type:	☐ Gasoline	☒ Diesel	☐ Natural Gas ☐ Propane
Maximum Fuel Usage Rate:	2 ☒ gal./hr.	☐ cfh	
Maximum Daily Hrs. of Operations:	12 (hours/day)		
Maximum Annual Hrs. of Operations:	2200 (hours/year)		
Stack Parameters:	Stack Height from Ground (ft): 8	Stack Exhaust Flow Rate (acfm):	?
	Stack Inside Diameter (ft): .33	Stack Exhaust Gas Temperature (°F):	?

☒ **$1,000 PTC application fee enclosed**

Certification of Truth, Accuracy, and Completeness (by Responsible Official)
I hereby certify that based on information and belief formed after reasonable inquiry, the statements and information contained in this and any attached and/or referenced document(s) are true, accurate, and complete in accordance with IDAPA 58.01.01.123-124.

Voyd Stewart — *Responsible Official Signature*

Vice President — *Responsible Official Title*

5-6-2008 ~~4/28/2008~~ — *Date*

Voyd Stewart
Print or Type Responsible Official Name

Form #AQ-F-C016
Rev. 2
12/12/06

Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706
For assistance, call the Air Permit Hotline: 1-877-5PERMIT

DEQ - AIR QUALITY PROGRAM

PORTABLE EQUIPMENT RELOCATION FORM

Company Name: Owen PC Construction LLC
Phone Number: 208-787-6936
Mailing Address: P.O. Box 1077 Victor, ID 83455
Contact: Voyd Stewart
Signature: Voyd Stewart Date: 5-6-08

Plant Type (HMA, Rock Crusher, Mfr., Model No.)		HMA CMI UDM 1200		
Type of Permit	Permit to Construct or ~~Operating Permit~~	(Yes)	No	If Yes, Facility ID:
	Permit by Rule	Yes	No	If Yes, Facility ID:
Fuel Type for Generator: #2 Diesel				
Have any major components of the plant or its air pollution equipment been replaced or modified since the plant last operated? Yes (No) If Yes, attach explanation on additional paper.				

Current Location, include county and nearest city: Driggs, Teton County
New Location, include county and nearest city: Driggs, Teton County
Estimated Startup Date: June 15, 2008 — Estimated End Date: July 15, 2008

Will Plant be co-located with another rock crusher, concrete batch, or hot-mix asphalt plant at new location?				~~Yes~~ (No)
If Yes	Name of Other Company:			
	Type of Plant: Rock Crusher Concrete Batch Hot-Mix Asphalt			
	Type of Permit: Permit to Construct or Operating Permit	Yes	No	If Yes, Facility ID:
	Type of Permit: Permit by Rule	Yes	No	If Yes, Facility ID:

Will plant be operated in conjunction with a state of Idaho contract?			~~Yes~~ (No)
If Yes	Contract No.:		
	State of Idaho Contact Person:		
	Phone Number:		

THIS FORM MUST BE SUBMITTED TEN (10) DAYS BEFORE PLANT IS RELOCATED.

A scaled plot plan identifying the property boundary of the new site must be included with this form (see Permit Application Form PP-Plot Plan for guidance).

Mail to: **Air Quality Program Office - Application Processing**
Department of Environmental Quality
1410 North Hilton
Boise, ID 83706-1255

Or, Fax to: **208-373-0340**

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 0
7/3/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
Company Name: Owen PC Construction LLC	**Facility Name:** 1580 Hotplant	**Facility ID No.:**
Brief Project Description: Permit existing portable asphalt drum mixer		

IDENTIFICATION				SCRUBBER						
1.	2.	3.	4.	5.	6.	7.	8.	9	10.	11.
Emission Unit	EU ID No.	CE ID No.	Stack ID No.	Manufacturer Name	Model No.	Efficiency (PM_{10}@70%, SO_2@50%, etc.)	Basis for Efficiency (i.e., guarantee, source test, etc.)	Design Scrubbing Liquid Flow (gpm)	Design Pressure Drop (in H_2O)	Design pH (for acid gas control)
CMI - UDM 1200	**1**	**1**	**1**	**CMI**	**UDM 1200**	**Designed to meet .04 gr/scf emissions limitation.**	**O.E.M. statements and previous source test. (attached)**	**200-250 gpm**	**7.5 in H2O**	**n/a**

Describe the maintenance required to assure the scrubber operates as designed (i.e. frequency of inspection, nozzle inspection, nozzle cleaning, etc.). (Provide an attachment if necessary.) The spray nozzles will be inspected weekly to insure proper operation. At that time nozzles that are clogged will be cleaned or replaced and those that show excessive wear will be replaced.

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PERMIT TO CONSTRUCT APPLICATION

Revision 3
4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	**Owen PC Construction LLC**
Facility Name:	1580 Hotplant
Facility ID No.:	
Brief Project Description:	Permit existing portable asphalt drum mixer

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - POINT SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Emissions units	**Stack ID**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
Point Source(s)													
CMI UDM 1200 Drum Dryer	1.00	1.66	1.83	1.25	1.38	6.25	6.88	85.00	93.50	4.25	4.68	n/a	
CAT 545 KW Diesel Generator	2.00	0.28	0.31	2.41	2.65	6.71	7.38	1.94	2.13	0.57	0.63	n/a	
name of the emissions unit4													
name of the emissions unit4													
name of the emissions unit5													
name of the emissions unit6													
name of the emissions unit7													
name of the emissions unit8													
name of the emissions unit9													
name of the emissions unit10													
name of the emissions unit11													
name of the emissions unit12													
name of the emissions unit13													
name of the emissions unit14													
name of the emissions unit15													
name of the emissions unit16													
name of the emissions unit17													
name of the emissions unit18													
name of the emissions unit19													
name of the emissions unit20													
name of the emissions unit21													
(insert more rows as needed)													
Total		1.94	2.14	3.66	4.03	12.96	14.26	86.94	95.63	4.82	5.31		

Instructions for Form EI-CP1

GEN SET PACKAGE PERFORMANCE DATA [BPG02595]

APRIL 23, 2008

(BPG02595)-ENGINE (AER00561)-GENERATOR (BCW00951)-GENSET

For Help Desk Phone Numbers Click here

Performance Number: DM6214 **Change Level:** 01

Sales Model: 3412CDITA **Combustion:** DI **Aspr:** TA

Engine Power:
545 W/F EKW 571 W/O F EKW
607.4 KW

Speed: 1,800 RPM **After Cooler:** JWAC

Manifold Type: DRY **Governor Type:** HYDRA **After Cooler Temp(C):** --

Turbo Quantity: 2 **Engine App:** GP **Turbo Arrangement:** Parallel

Hertz: 60 **Engine Rating:** PGS **Strategy:**

Rating Type: PRIME **Certification:** EPA TIER-1 2000 - 2005

General Performance Data

GEN W/F EKW	PERCENT LOAD	ENGINE POWER BKW	ENGINE BMEP KPA	FUEL RATE G/BKW-HR	FUEL RATE LPH	INTAKE MFLD TEMP DEG C	INTAKE MFLD P KPA	INTAKE AIR FLOW M3/MIN	EXH MFLD TEMP DEG C	EXH STACK TEMP DEG C	EXH GAS FLOW M3/MIN
545.0	100	607.3	1,498	218.700	158.3	88.9	162.6	49.4	640.5	505.5	134.0
490.5	90	547.0	1,349	216.300	141.0	87.4	140.6	45.6	611.8	488.8	121.0
436.0	80	488.1	1,203	214.000	124.5	86.1	120.5	42.0	583.9	472.8	109.2
408.8	75	459.0	1,132	213.300	116.7	85.5	110.6	40.2	570.4	465.1	103.5
381.5	70	430.0	1,060	212.800	109.1	84.9	101.1	38.5	556.9	457.3	97.9
327.0	60	372.8	919	212.700	94.5	84.0	83.2	35.1	530.2	442.1	87.4
272.5	50	316.2	780	215.900	81.4	83.1	66.6	32.0	501.3	424.1	77.3
218.0	40	261.2	644	223.200	69.5	82.5	51.9	29.1	466.3	399.3	67.8
163.5	30	204.7	505	234.700	57.3	81.9	38.3	26.4	424.3	367.6	58.5
136.3	25	175.9	434	243.400	51.0	81.6	31.9	25.1	400.6	349.1	54.0
109.0	20	146.7	362	255.400	44.7	81.3	26.5	24.1	367.9	322.9	49.6
54.5	10	87.2	215	304.500	31.6	80.9	15.9	22.2	299.1	267.6	41.2

Heat Rejection Data

GEN W/F EKW	PERCENT LOAD	REJ TO JW KW	REJ TO ATMOS KW	REJ TO EXHAUST KW	EXH RCOV TO 177C KW	FROM OIL CLR KW	FROM AFT CLR KW	WORK ENERGY KW	LHV ENERGY KW	HHV ENERGY KW
545.0	100	365.0	122.0	594.0	339.0	50.0	71.0	607.0	1,584.0	1,687.0
490.5	90	325.0	103.0	526.0	295.0	47.0	53.0	547.0	1,410.0	1,502.0
436.0	80	288.0	84.0	465.0	257.0	44.0	38.0	488.0	1,244.0	1,325.0
408.8	75	270.0	76.0	437.0	239.0	42.0	32.0	459.0	1,166.0	1,242.0
381.5	70	253.0	69.0	409.0	222.0	40.0	26.0	430.0	1,089.0	1,160.0
327.0	60	220.0	55.0	357.0	190.0	37.0	15.0	373.0	943.0	1,005.0
272.5	50	190.0	50.0	309.0	161.0	34.0	6.0	316.0	812.0	865.0
218.0	40	163.0	52.0	262.0	131.0	31.0	-1.0	261.0	693.0	738.0
163.5	30	135.0	54.0	216.0	101.0	27.0	-6.0	205.0	571.0	608.0
136.3	25	120.0	53.0	193.0	86.0	25.0	-9.0	176.0	509.0	542.0

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BKW	TOTAL NOX (AS NO2) G/HR	TOTAL CO G/HR	TOTAL HC G/HR	TOTAL CO2 KG/HR	PART MATTER G/HR	OXYGEN IN EXHAUST PERCENT
545.0	100	607.3	4,503.00	1,302.00	52.00	430.7	173.50	9.7000
408.8	75	459.0	3,800.00	789.00	46.00	326.8	93.10	10.8000
272.5	50	316.2	2,887.00	339.00	43.00	234.7	56.10	12.2000
136.3	25	175.9	1,696.00	302.00	31.00	146.4	47.90	14.0000
54.5	10	87.2	1,077.00	316.00	54.00	87.6	39.10	16.1000

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BKW	TOTAL NOX (AS NO2) mg/norm cu M @ %5 O2	TOTAL CO mg/norm cu M @ %5 O2	TOTAL HC mg/norm cu M @ %5 O2	PART MATTER mg/norm cu M @ %5 O2	OXYGEN IN EXHAUST PERCENT
545.0	100	607.3	2,490.2	739.5	27.2	96.5	9.7000
408.8	75	459.0	2,834.5	561.5	35.5	69.1	10.8000
272.5	50	316.2	3,080.1	348.1	46.5	58.9	12.2000
136.3	25	175.9	2,896.3	516.7	52.6	81.8	14.0000
54.5	10	87.2	2,991.6	899.1	160.3	110.2	16.1000

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BKW	TOTAL NOX (AS NO2) PPM @ % 5 O2	TOTAL CO PPM @ %5 O2	TOTAL HC PPM @ %5 O2	OXYGEN IN EXHAUST PERCENT
545.0	100	607.3	1,335	587	45	9.7000
408.8	75	459.0	1,516	453	56	10.8000
272.5	50	316.2	1,665	290	74	12.2000
136.3	25	175.9	1,566	413	84	14.0000
54.5	10	87.2	1,638	708	246	16.1000

RATED SPEED "Nominal Data"

GEN PWR EKW	PERCENT LOAD	ENGINE POWER BKW	TOTAL NOX (AS NO2) G/HP-HR	TOTAL C0 G/HP-HR	TOTAL HC G/HP-HR	PART MATTER G/HP-HR	OXYGEN IN EXHAUST PERCENT
545.0	100	607.3	5.53	1.60	0.06	0.21	9.7000
408.8	75	459.0	6.17	1.28	0.08	0.15	10.8000
272.5	50	316.2	6.81	0.80	0.10	0.13	12.2000
136.3	25	175.9	7.19	1.28	0.13	0.20	14.0000
54.5	10	87.2	9.21	2.70	0.47	0.34	16.1000

	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the **Air Permit Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 2 4/5/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Owen PC Construction LLC
Facility Name:	1580 Hotplant
Facility ID No.:	
Brief Project Description:	Permit existing portable asphalt drum mixer.

SUMMARY OF FACILITY WIDE EMISSION RATES FOR CRITERIA POLLUTANTS - FUGITIVE SOURCES

1.	2.	3.											
		PM_{10}		SO_2		NO_X		CO		VOC		Lead	
Fugitive Source Name	**Fugitive ID**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**	**lb/hr**	**T/yr**
Fugitive Source(s)													
Elevator, Bins,Screens, etc.	3.00	7.50	8.25	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Cold Aggregate Equipment	4.00	10.00	11.00	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
name of fugitive source3													
name of fugitive source4													
name of fugitive source5													
name of fugitive source6													
name of fugitive source7													
name of fugitive source8													
name of fugitive source9													
name of fugitive source10													
name of fugitive source11													
name of fugitive source12													
name of fugitive source13													
name of fugitive source14													
name of fugitive source15													
name of fugitive source16													
name of fugitive source17													
name of fugitive source18													
name of fugitive source19													
name of fugitive source20													
name of fugitive source21													
(insert more rows as needed)													
Total		17.50	19.25										

Instructions for Form EI-CP2

This form is designed to provide the permit writer and air quality modeler with a summary of the criteria pollutant emissions of each emission unit/point located at the facility. This information may be used by the IDEQ to perform an air quality analysis or to review an air quality analysis submitted with the permit application or requested by the IDEQ.

Emission Inventory

Source	Tons/Year TSP	PM-10	NOX	VOC	CO	SOX
CMI Drum Dryer	2.28	1.83	6.88	4.68	93.50	1.38
Elevator, Sceens, Bins, and Mixer	55.00	8.25				
Cold Aggregate Handling	27.50	11.00				
Diesel Generator (600 KW)	0.47	0.31	20.37	0.63	4.66	2.65
Haul Roads	15.00	6.75				
Total	100.26	28.13	27.25	5.30	98.16	4.02

CMI Drum Dryer

Maximum Process Rate: 250 tons/hr (MAXIMUM DESIGN)
Process Airflow Rate: 6050 dscf/min
Hours of operation: 2200 hr/yr
TSP Emissions

Emission Factor: 0.04 gr/dscf
Calculations: 0.04 gr/dscf * 6050 dscf/min * 1lb/7000gr * 60 min/hr = 2.07 lbs/hr
2.07 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 2.28 tons/yr

PM-10 Emissions:

Emission Factor: 0.032 gr/dscf (80% of TSP is PM-10 from AP-42, Table 8.1-2, 10/86)
Calculations: 0.032 gr/dscf * 6050 dscf/min * 1lb/7000gr * 60 min = 1.66 lbs/hr
1.66 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 1.83 tons/yr

NOx Emissions:

Emission Factor: 0.025 lbs/ton (AP-42, Table 11.1-8)
Calculations: 0.025 lbs/ton * 250 tons/hr = 6.25 lbs/hr
6.25 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 6.88 tons/yr

VOC Emissions:

Emission Factor: 0.017 lbs/ton (AP-42, Table 11.1-8)
Calculations: 0.017 lbs/ton * 250 tons/hr = 4.25 lbs/hr
4.25 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 4.68 tons/yr

CO Emissions:

Emission Factor: 0.34 lbs/ton (AP-42, Table 11.1-8)
Calculations: 0.340 lbs/ton * 250 tons/hr = 85.00 lbs/hr
85.00 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 93.50 tons/yr

SOx Emissions:

Emission Factor: 0.005 lbs/ton (AP-42, Table 11.1-8)
Calculations: 0.005 lbs/ton * 250 tons/hr = 1.25 lbs/hr
1.25 lbs/hr * 2200 hr/yr*0.0005 tons/lb = 1.38 tons/yr

Elevator, Sceens, Bins, and Mixer

Process Rate: 250 tons/hr (Maximum Design)
Hours of operation: 2200 hr/yr

TSP Emissions

Emission Factor: 0.2 lbs/ton (AFSSCC 3-05-002-02, page 116, 3/90)
Calculations: 0.20 lbs/ton * 250 tons/hr = 50.00 lbs/hr
50.00 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 55.00 tons/yr

PM-10 Emissions:

Emission Factor: 0.03 lbs/ton (AFSSCC 3-05-002-02, page 116, 3/90)
Calculations: 0.03 lbs/ton * 250 tons/hr = 7.50 lbs/hr
7.50 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 8.25 tons/yr

Cold Aggregate Handling

Process Rate: 250 tons/hr (Maximum Design)
Hours of operation: 2200 hr/yr

TSP Emissions

Emission Factor: 0.10 lbs/ton (AFSSCC 3-05-002-04, page 116, 3/90)
Calculations: 0.10 lbs/ton * 250 tons/hr = 25.00 lbs/hr
25.00 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 27.50 tons/yr

PM-10 Emissions:

Emission Factor: 0.04 lbs/ton (AFSSCC 3-05-002-04, page 116, 3/90)
Calculations: 0.04 lbs/ton * 250 tons/hr = 10.00 lbs/hr
10.00 lbs/hr * 2200 hr/yr *0.0005 tons/lb = 11.00 tons/yr

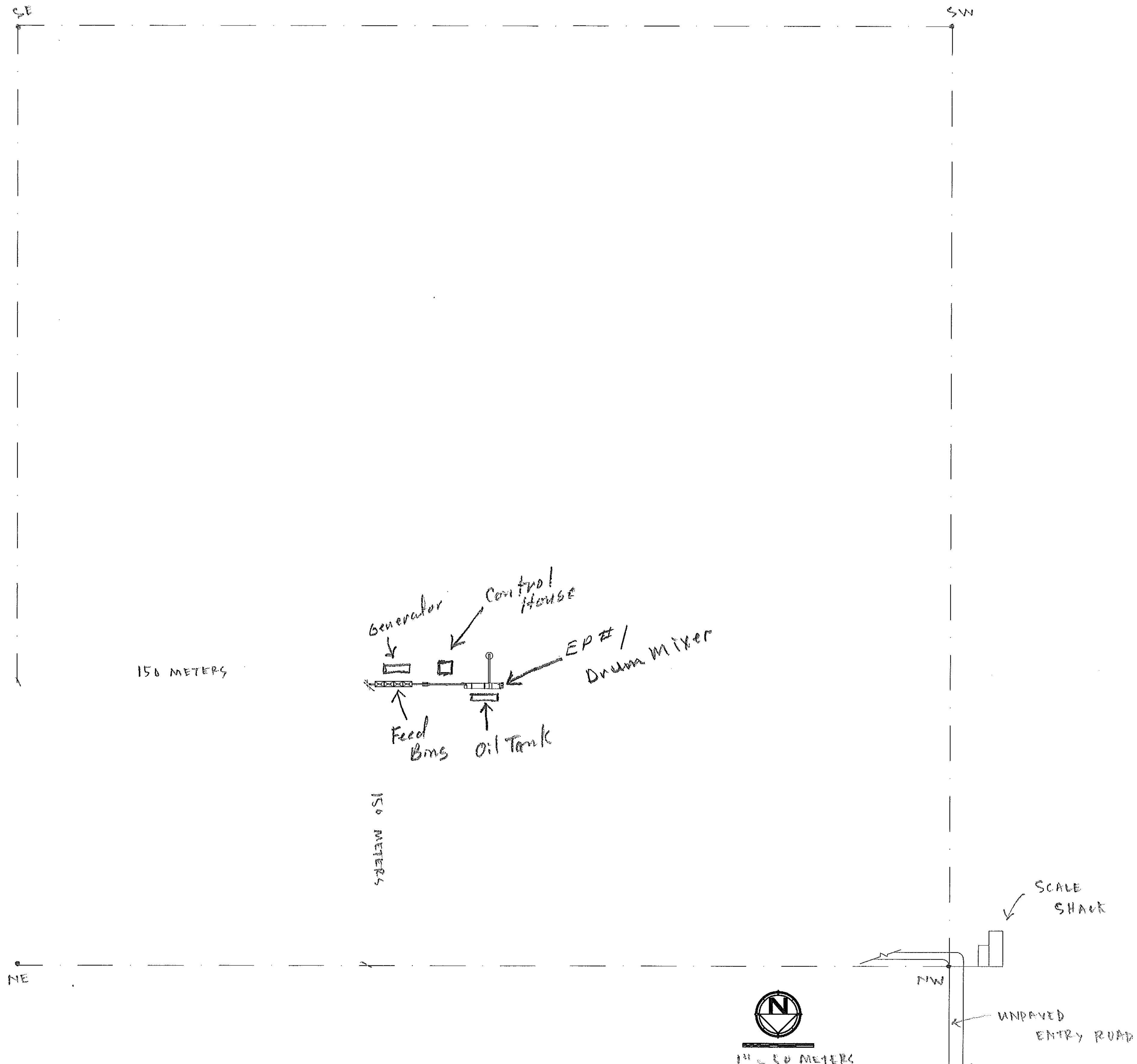
Diesel Generator (600 KW)

Hours of operation: 2200 hr/yr
Number of Generators 1 Generator
TSP Emissions

Emission Factor: 0.4303 lbs/hr (AP-42, Table 3.3-2, 7/93)
Calculations: 0.430 lbs/hr * 2200 hr/yr * 0.0005 tons/lb = 0.47 tons/yr

PM-10 Emissions:

Emission Factor: 0.2799 lbs/hr (AP-42, Table 3.3-2, 7/93)
Calculations: 0.280 lbs/hr * 2200 hr/yr * 0.0005 tons/lb = 0.31 tons/yr



General Notes

SECTION_31

TOWNSHIP_5_NORTH

RANGE_46

TETON_COUNTY-IDAHO

No.	Revision/Issue	Date

Firm Name and Address

OWEN PC CONSTRUCTION

Project Name and Address

SITEPLAN
OWENPC
GRAVELPIT
LEGEL_DESC_ABOVE

Project	Sheet
HOTMIXPLANT	1
Date: APRIL2008	
Scale: ASNOTED	

Project HOTMIXPLANT Sheet 1
Date APRIL2008
Scale ASNOTED
Project Name and Address
SITEPLAN
OWENPC
GRAVELPIT
LEGEL_DESC_ABOVE
Firm Name and Address
OWEN PC CONSTRUCTION
No. Revision/Issue Date
General Notes
SECTION_31
TOWNSHIP_5_NORTH
RANGE_46
TETON_COUNTY-IDAHO

DEQ AIR QUALITY PROGRAM
1410 N. Hilton, Boise, ID 83706
For assistance, call the
Air Permit Hotline – 1-877-5PERMIT

PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/26/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
Company Name: Owen PC Construction	Facility Name: 1580 Hotplant	Facility ID No:
Brief Project Description:	Permit existing portable asphalt drum mixer.	

APPLICABILITY DETERMINATION		
1. Will this project be subject to 1990 CAA Section 112(g)? (Case-by-Case MACT)	☒ NO	☐ YES* * If YES, applicant must submit an application for a case-by-case MACT determination [IAC 567 22-1(3)"b" (8)]
2. Will this project be subject to a New Source Performance Standard? (40 CFR part 60)	☐ NO	☒ YES* *If YES, please identify sub-part: I
3. Will this project be subject to a MACT (Maximum Achievable Control Technology) regulation? (40 CFR part 63) THIS ONLY APPLIES IF THE PROJECT EMITS A HAZARDOUS AIR POLLUTANT	☒ NO	☐ YES* *If YES, please identify sub-part: _____
4. Will this project be subject to a NESHAP (National Emission Standards for Hazardous Air Pollutants) regulation? (40 CFR part 61)	☒ NO	☐ YES* *If YES, please identify sub-part: _____
5. Will this project be subject to PSD (Prevention of Significant Deterioration)? (40 CFR section 52.21)	☒ NO	☐ YES
6. Was netting done for this project to avoid PSD?	☒ NO	☐ YES* *If YES, please attach netting calculations

IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT

NSPS PARTICULATE EMISSION COMPLIANCE TEST REPORT

for

HAMM ASPHALT COMPANY

Perry, Kansas

June 26, 1986
86-070-3

Burns & McDonnell
ENGINEERS - ARCHITECTS - CONSULTANTS

I, Richard L. Howes, hereby certify that the particulate emissions tests conducted at the Hamm Asphalt Plant, located near Perry, Kansas, are in accordance with procedures established by the United States Environmental Protection Agency. This report accurately and faithfully represents the data obtained from this test and the results determined from analysis of this data.

Richard L. Howes

Richard L. Howes
Field Test Crew Chief
Air Quality Control Division

4800 EAST 63rd STREET, P.O. BOX 173, KANSAS CITY, MISSOURI 64141 • TEL: 816-333-4375 TWX: 910-771-3059

TABLE OF CONTENTS

INTRODUCTION

INTRODUCTION

This report presents the final results of the source emission compliance testing performed at the Hamm Asphalt Company's plant located near Perry, Kansas.

The purpose of the testing was to determine the particulate emissions rate from the unit. The emission testing was performed by Burns & McDonnell Engineering Company whose main office is located at 4800 East 63rd Street, Kansas City, Missouri 64141.

The unit was tested on June 26, 1986 for particulate emissions. The testing was performed in accordance with EPA Reference Methods 1, 2, 3, 4, and 5 as published in the Federal Register of Thursday, December 23, 1971 and subsequent revisions to these methods as published in the July 1, 1985 Code of Federal Regulations, Title 40, Part 60, Subpart I and Appendix A.

The testing equipment, sampling procedures and analytical procedures are described in Section IV of the report.

The raw field data, plant data, equipment calibrations, lab analysis reports, equations used in determining final results and various correspondence pertaining to the test are presented in the Appendix.

SUMMARY OF TEST RESULTS

SUMMARY OF TEST RESULTS

The following chart below shows the test results from the three particulate test runs at the Hamm Asphalt Company's plant located near Perry, Kansas on June 26, 1986:

Run No.	Plant Production Rate	Emission Rates lb/hour	Emission Rates grains/dscf
1	292.1 tons/hour	3.07 lb/hour	.0257 gr/dscf
2	292.1 tons/hour	3.01 lb/hour	.0258 gr/dscf
3	292.1 tons/hour	3.59 lb/hour	.0303 gr/dscf
Daily Average	292.1 tons/hour	3.22 lb/hour	.0273 gr/dscf

Recycle mix accounted for approximately 40 percent of the total production rate. Propane gas was fired in the burner during the testing.

Subpart I - Standards of Performance for Asphalt Concrete Plants =

(1) .04 grains/dscf

(2) 20 percent opacity

* * * * *

HAMM ASPHALT COMPANY
86-070-3
PARTICULATE COMPLIANCE TEST HAMM ASPHALT
30-JUN-86

PARTICULATE TEST RESULTS

	RUN NUMBER		1	2	3
	TEST DATE		6-26-8	6-26-8	6-26-8
PC	PITOT COEFFICIENT		.77	.77	.77
AF	FLUE AREA	SQ FT	5.77	5.77	5.77
PB	BAROMETRIC PRESSURE	IN HG	29.10	29.10	29.10
VL	VOLUME OF CONDENSATE	ML	866.7	799.9	744.8
TF	FLUE TEMPERATURE	DEG F	164.0	164.3	166.1
SDP	SQUARE ROOT OF DELTA P		1.330	1.328	1.310
PS	STATIC PRESSURE	IN H2O	1.10	1.10	1.10
DH	ORIFICE PRESSURE DIFF.	IN H2O	2.868	2.554	2.530
TM	METER TEMPERATURE	DEG F	89.3	106.8	108.7
VM	VOLUME SAMPLED	CF	64.25	57.68	59.50
MC	METER CORRECTION FACTOR		1.003	1.003	1.003
DN	NOZZLE DIAMETER	IN	0.251	0.251	0.251
T	TIME SAMPLED	MIN	72	72	72
CO2	PERCENT CO2	%	4.60	5.20	5.90
O2	PERCENT O2	%	11.00	9.90	9.10
CO	PERCENT CO	%	0.00	0.00	0.00
N2	NITROGEN IN FLUE GAS	%	84.40	84.90	85.00
MW	MOLECULAR WEIGHT	LB/LB-M	24.68	24.55	24.87
TA	TOTAL AIR	%	197	179	168
	FILTER NUMBER		250	271	276
	ACETONE WASH NUMBER		193	42	104
WG	TOTAL PARTICULATE MATTER	G	0.1011	0.0883	0.1064
PF	ABSOLUTE FLUE PRESSURE	IN HG	29.18	29.18	29.18
VW	VOLUME OF WATER VAPOR	SCF	40.80	37.65	35.06
VMS	VOLUME OF METERED GAS	DSCF	60.64	52.71	54.19
M	MOISTURE IN FLUE GAS	%	40.22	41.67	39.28
VG	VELOCITY OF FLUE GAS	FPS	81.50	81.60	80.10
VO	VOLUME OF FLUE GAS	ACFM	28193.	28228.	27708.
VOS	VOLUME OF FLUE GAS	DSCFH	834250.	814570.	829854.
VT	VOLUME OF FLUE GAS	ACF	123.0	109.6	108.6
WD	DUST CONCENTRATION	LB/DSCF	.368E-05	.370E-05	.433E-05
WH	DUST CONCENTRATION	LB/HR	3.07	3.01	3.59
WA	DUST CONCENTRATION	GRS/ACF	.012694	.012440	.015117
WS	DUST CONCENTRATION	GRS/DSCF	.025746	.025872	.030292
I	ISOKINETIC SAMPLING	%	102.	91.	91.

DESCRIPTION OF TESTED FACILITY

DESCRIPTION OF TESTED FACILITY

The Hamm Asphalt Company's plant is a portable drum mix plant manufactured by CMI, Model No. 1200, unitized drum mixer which has been converted to a recycle plant. At the time the test was conducted, June 26, 1986, the plant was located on 59 Highway approximately five miles north of 24 Highway.

The plant operated under normal operating conditions and averaged a production rate of 292 tons of asphalt per hour during the day of testing.

The particulate emissions are controlled by a CMI wet washer dust collector. The pressure drop across the dust collector system varied between 7.5 and 7.6 inches H_2O during the compliance testing. Propane gas was fired in the asphalt burner during the tests. The flue gas discharges to the atmosphere through a stack approximately 16 feet above the fan discharge flange.

SAMPLING AND ANALYTICAL PROCEDURES

TESTING EQUIPMENT - EPA REFERENCE METHOD 5 (PARTICULATE)

High-Volume Source Sampling Train

An Acurex Corp., Aerotherm High-Volume Stack Sampler (Model HVSS-045) was used at the sampling location(s). The HVSS particulate sampling train consisted basically of a 3-foot effective length x 2-1/2-inch-diameter stainless-steel probe; a variable-heat-controlled filter oven with a calibrated Type K (Chrome/Alumel) thermocouple; a stainless-steel, Teflon-coated filter holder; a standard lexan/stainless-steel impinger assembly with a calibrated Type K (Chromel/Alumel) thermocouple located at the impinger outlet; a 3/4-hp, shaft-sealed, carbon vane vacuum pump assembly with a vacuum gauge; a control unit with an elapse time indicator, a temperature selector switch, a temperature indicator (potentiometer), temperature controllers, calibrated magnehelic gauges, a calibrated dry gas meter and a calibrated variable-diameter orifice; and an umbilical and various interconnecting hoses, fittings and valves. An appropriately sized stainless-steel nozzle, a calibrated Type K (Chromel/Alumel) temperature sensor, a static pressure tube, a calibrated S-type pitot tube and a variable-heat-controlled stainless-steel liner with a calibrated Type K (Chromel/Alumel) thermocouple are integral parts of the probe assembly.

The vacuum pump unit was used to control gas sampling rates. The control unit was used to control probe and oven temperatures. The control unit was also used to monitor elapsed sampling times, temperatures, velocities, static pressure, gas sampling rates and sampled gas volume.

numbered glass petri dishes, oven dried at 220 degrees Fahrenheit for two to three hours, cooled in a desiccator for two hours and individually weighed on a Sartorious analytical balance to the nearest 0.1-milligram, and then weighed every six hours, minimum, until two consecutive weights within ±0.5-milligram were obtained. Several 250 milliliter crucibles were desiccated for a minimum of 24 hours and weighed in the same manner as the filters and petri dishes. Also, several 350-gram quantities of Type 6-16 mesh indicating silica gel were weighed-out on an Mettler digital balance and individually placed into separate airtight polypropylene storage bottles.

The number of sampling points and positions of the points in the flue at the sampling location(s), and the sampling time at each point were determined prior to the particulate testing. the sampling procedures were performed in accordance with the Environmental Protection Agency's Reference Method 5, "Determination of Particulate Emissions from Stationary Sources" in the Thursday, August 18, 1977 Federal Register, "Standards of Performance for New Stationary Sources" and subsequent revisions in the July 1, 1985 Code of Federal Regulations, Title 40, "Protection of Environment, Parts 53 to 80.

A HVSS sampling train was prepared inpart at the sampling locations(s), before each test run, in the following manner: An appropriately sized sampling nozzle was installed onto the inlet of a sampling probe and capped. The probe was then dimensioned and marked with glass-cloth tape at increments that corresponded with the predetermined sampling point positions in the flue. A standard impinger assembly was prepared by adding 250 milliliters of 3 percent concentration hydrogen peroxide, in lieu of distilled water, to each of the

calculated at each sampling point using a Sharp, Model 1211, pocket computer.

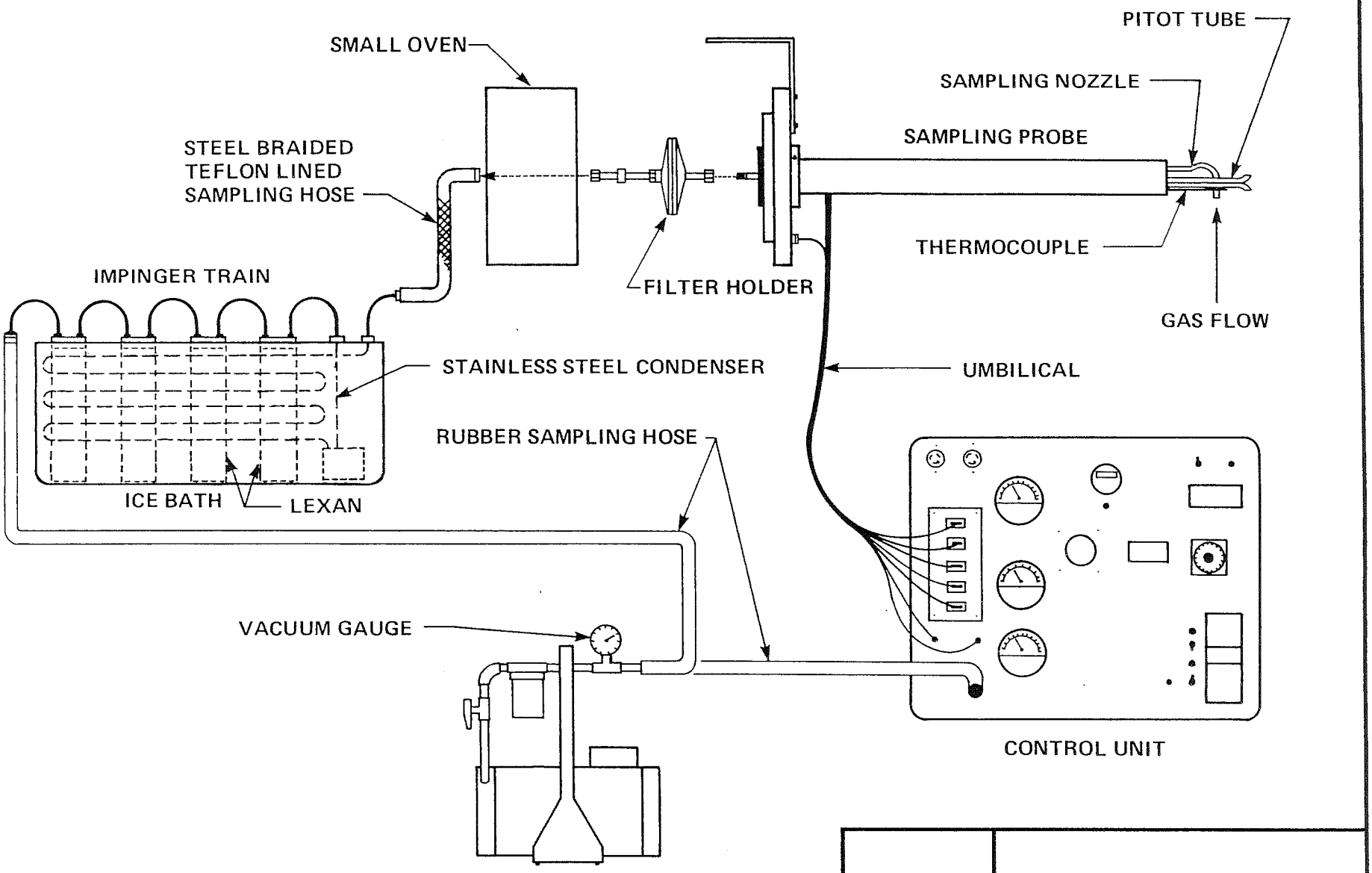
Three test runs were performed at the sampling location(s). A total of 24 points (8 points from each of the 3 sampling ports) were sampled in the flue. Each point was sampled for a period of 3 minutes at a calculated isokinetic sampling rate. The sampling data for each test run was recorded on a field test form during each of the sampling periods.

After the completion of a test run, the following procedures were performed: A final leak-check was performed at 15 inches of mercury vacuum, minimum, for one minute and the leakage rate recorded. The flue gas moisture collected in the first three impingers was measured and recorded. The moisture laden silica gel in the fourth impinger was transferred to an appropriately marked, airtight polyropylene storage bottle and retained for later weighing. The weight gain of the silica gel moisture collection was added to the measured moisture condensed during the test run to determine the total moisture collected for that run. The sampling nozzle, sampling probe and filter holder were capped and taken to a clean area for sample recovery. At the recovery area, the disc filter was carefully removed from the filter holder and transferred to its petri dish for later desiccation and weighing. The sampling nozzle, probe, and filter holder were washed with nanograde acetone. The acetone washing and an acetone blank were collected in appropriately labeled polyropylene sample bottles and retained for later evaporation, desiccation and weighing.

acetone in a crucible had completely evaporated, the crucible was transferred to a desiccator for further drying at room temperature for a minimum of 24 hours before weighing, and weighed every six hours, minimum, until two consecutive weihts within ±0.5-milligram were obtained. Each acetone blank collected was used to determine the amount of residual weight each crucible retained due to acetone impurities. Each disc filter and petri dish, acetone washing and acetone blank was individually weighed on a Sartorious analytical balance with a sensitivity of 0.1-milligram.

All test instruments were recalibrated to determine the deviation percentage.

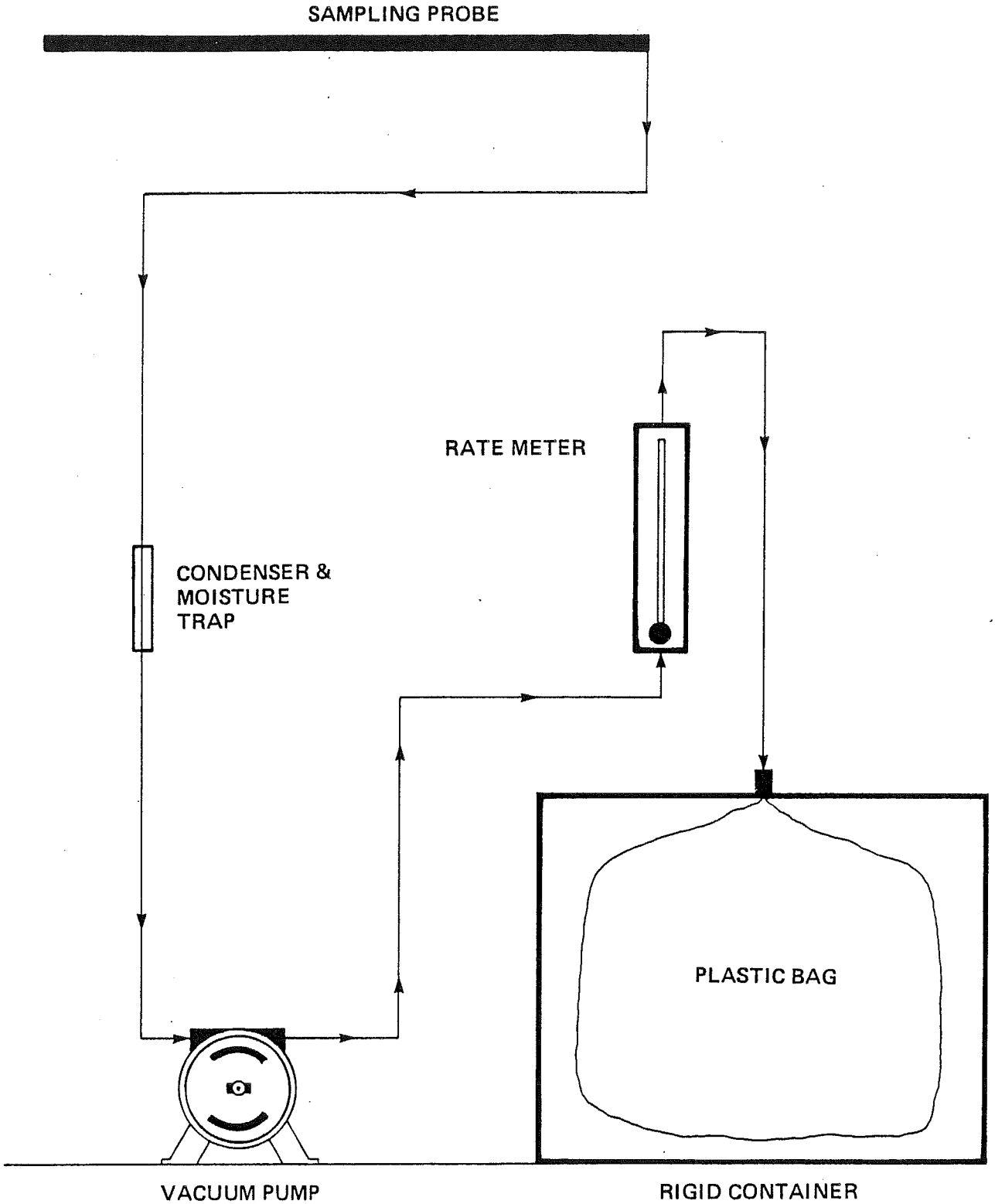
* * * * *



Burns & McDonnell
ENGINEERS - ARCHITECTS - CONSULTANTS

Exhibit 1
AEROTHERM
SAMPLING TRAIN

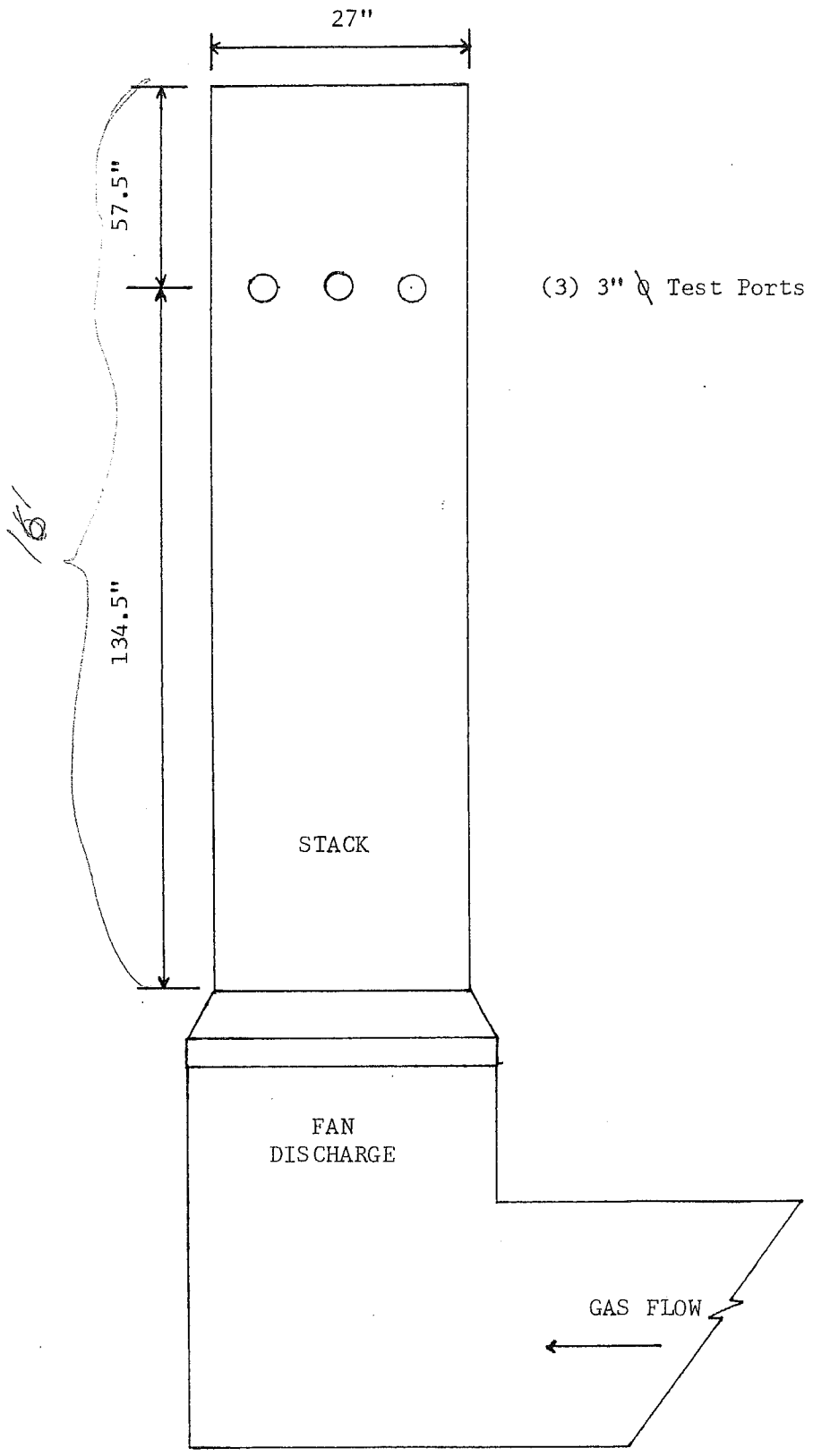
022081 Form AQD-(T-S)-36N



Burns & McDonnell
Engineers-Architects-Consultants

Exhibit 2

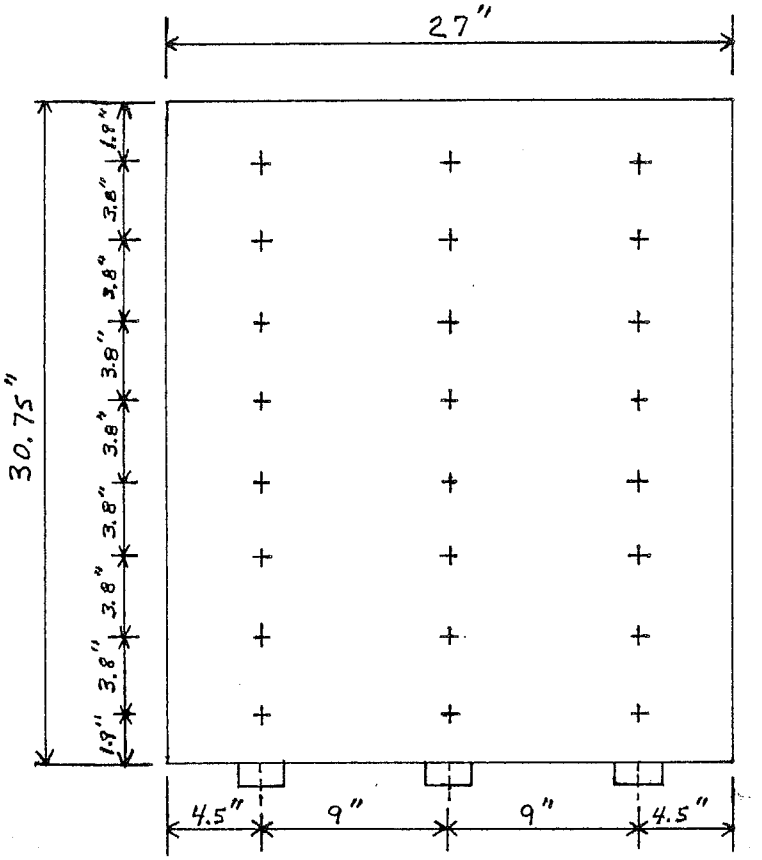
INTEGRATED BAG
SAMPLING TRAIN



NOT TO SCALE

Burns & McDonnell

Exhibit 3
TEST PORT LOCATIONS



(3) 3" ∅ Test Ports

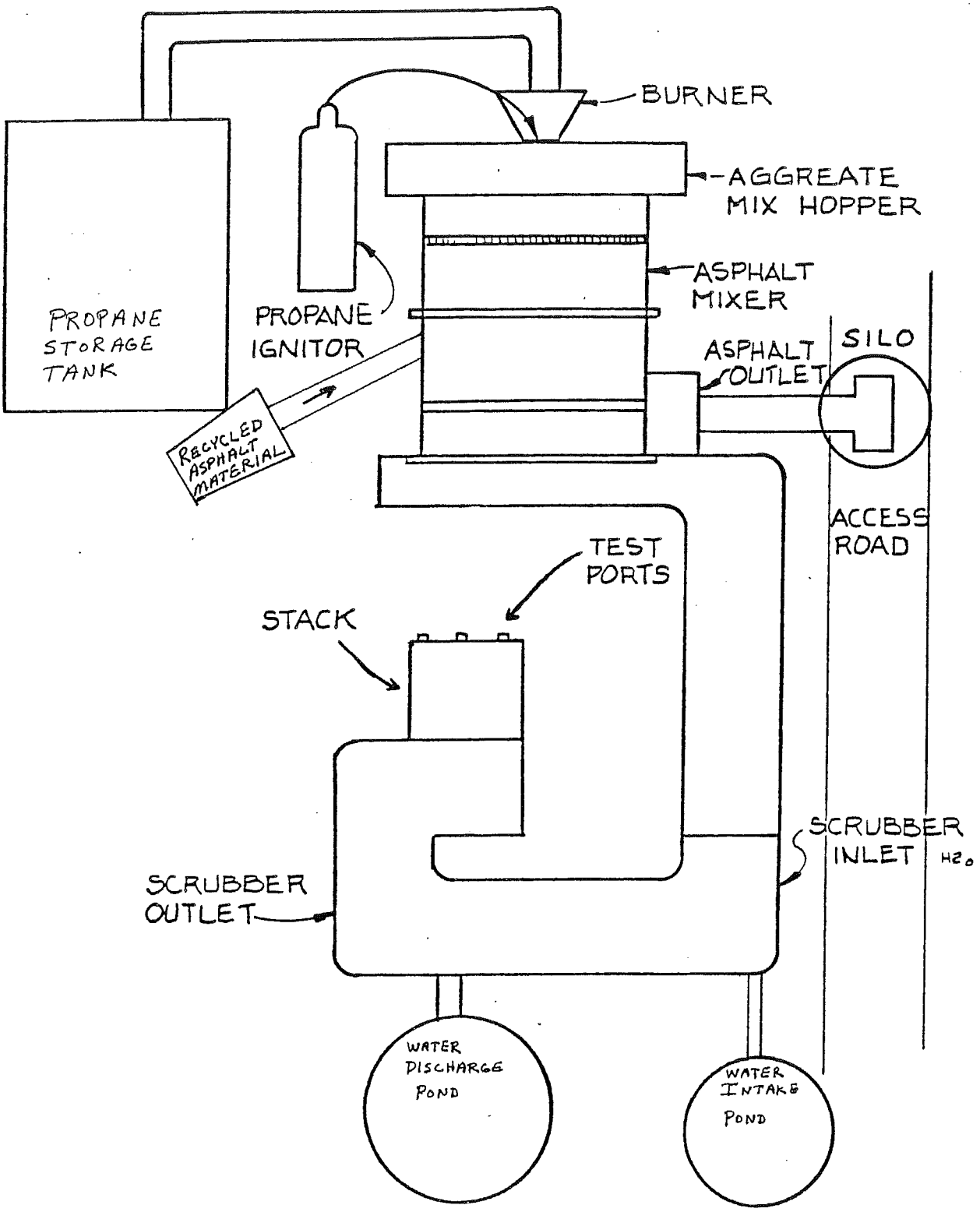
Port length= 2"

Equivalent Diameter = 28.75"
Stack Area = 5.7656 square feet

NOT TO SCALE

Burns & McDonnell

Exhibit 4
TEST PORT LOCATIONS



BURNS & McDONNELL	EXHIBIT 5 GENERAL ARRANGEMENT

APPENDIX

EPA DUST LOADING FORMULAS

NOMENCLATURE

acf	=	actual cubic feet
acfm	=	actual cubic feet per minute
A	=	effective area of flue in square feet
acm	=	actual cubic meters
acmm	=	actual cubic meters per minute
A_n	=	inside area of sampling nozzle in square feet
B_{ws}	=	water vapor in gas stream, proportion by volume
%C	=	percent carbon by weight, dry basis
%CO	=	percent carbon monoxide by volume, dry basis
$\%CO_2$	=	percent carbon dioxide by volume, dry basis
C_p	=	pitot tube coefficient
D_I	=	dust loading per heat input in pounds (grams) per million Btu (calories) per Fr constant
D_I'	=	dust loading per heat input in pounds (grams) per million Btu (calories) per Fr calculated
dscf	=	dry standard cubic feet
dscfh	=	dry standard cubic feet per hour
dscm	=	dry standard cubic meters
dscmh	=	dry standard cubic meters per hour
fps	=	feet per second
F_r	=	ratio factor of dry flue gas volume to heat value of combusted fuel in dry standard cubic feet (meters) per million Btu (calories)
gms	=	grams
gm-mole	=	gram-mole
grs	=	grains
ΔH	=	orifice pressure drop in inches water, average
%H	=	percent hydrogen by weight, dry basis
H_c	=	heat of combustion in Btu per pound, dry basis
hr	=	hour
%I	=	percent isokinetic
in. Hg	=	inches mercury
lbs	=	pounds
lb-mole	=	pound-mole
%M	=	percent moisture by volume
mmBtu	=	million Btu
mmcal	=	million calories
mm Hg	=	millimeters mercury
mps	=	meters per second
M_s	=	molecular weight in pound (gram) per pound (gram) mole (wet basis)
%N	=	percent nitrogen by weight, dry basis
$\%N_2$	=	percent nitrogen by difference, dry basis
%O	=	percent oxygen by difference, dry basis
$\%O_2$	=	percent oxygen by volume, dry basis
P_b	=	barometric pressure in inches mercury
P_{std}	=	standard absolute pressure (29.92 in Hg)
P_s	=	absolute pressure in flue in inches (millimeters) mercury
P_f	=	static pressure in flue in inches water, average
$\sqrt{\Delta P}$	=	square root of velocity head in inches water, average
%S	=	percent sulfur by weight, dry basis
scf	=	standard cubic feet
scm	=	standard cubic meters
T_{std}	=	absolute temperature of air in degrees Rankine at standard conditions (528 degrees)
T_s	=	absolute temperature of flue gas in degrees Rankine, average
T_m	=	absolute temperature at meter in degrees Rankine, average
V_s	=	velocity of flue gas in feet (meters) per second
V_l	=	volume of condensate through the impingers in milliliters
V_{lc}	=	volume of liquid collected in condenser in milliliters plus weight of liquid absorbed in silica gel in grams indicated as milliliters
V_m	=	volume of metered gas measured at meter conditions in cubic feet
V_{ms}	=	volume of metered gas corrected to dry standard conditions in cubic feet (meters)
V_o	=	volume of flue gas at actual conditions in cubic feet (meters) per minute
Q_{sd}	=	volume of flue gas corrected to dry standard conditions in cubic feet (meters) per hour
V_t	=	total volume of flue gas sampled at actual conditions in cubic feet (meters)
V_w	=	volume of water vapor in metered gas corrected to standard conditions in cubic feet (meters)
V_{wc}	=	volume of water condensed in impingers corrected to standard conditions
V_{wsg}	=	volume of water collected in silica gel corrected to standard conditions
W_a	=	total weight of dust collected per unit volume in grains (grams) per actual cubic feet (meters)
W_d	=	total weight of dust collected per unit volume in pounds (grams) per dry standard cubic feet (meters)
W_g	=	total weight of dust collected in grams
W_h	=	total weight of dust collected per unit volume in pounds (grams) per hour, dry basis
W_p	=	total weight of dust collected in pounds
W_s	=	total weight of dust collected per unit volume in grains (grams) per dry standard cubic feet (meters)
W_{sg}	=	impinger silica gel weight gain in grams
Y	=	metered gas volume correction factor
Θ	=	total elapsed sampling time in minutes

EPA DUST LOADING FORMULAS (Continued)

(11) DUST CONCENTRATION FOR INDIRECT HEATING UNIT AT ACTUAL CONDITIONS AND STANDARD CONDITIONS

W_g = gms

$W_p = 0.002205 \times W_g$ (lb)

$W_d = \frac{W_p}{V_{ms}}$ (lb/dscf)

$W_h = W_d \times Q_{sd}$ (lb/hr dry)

$W_a = \frac{7000 \times W_p}{V_t}$ (gr/acf)

$W_s = 7000 \times W_d$ (gr/dscf)

$D_l = \frac{9820 \times 20.9 \times W_d}{(20.9 - \%O_2)}$ (lb/mmBtu with constant 9820 F_r)

$F_r = \frac{10^6 \times [(3.64 \times \%H) + (1.53 \times \%C) + (0.57 \times \%S) + (0.14 \times \%N) - (0.46 \times \%O)]}{H_c}$ (dscf/mmBtu)

$D_l' = \frac{20.9 \times W_d \times F_r}{(20.9 - \%O_2)}$ (lb/mmBtu with calculated F_r)

(12) PERCENT OF ISOKINETIC SAMPLING

$$\%I = \frac{1.667 \times T_s \times \left\{0.00267 \times V_{lc} + \left[\frac{V_m \times Y}{T_m} \times \left(P_b + \Delta H/13.6\right)\right]\right\}}{\Theta \times V_s \times P_s \times A_n}$$

TEST DATA SHEETS

AIR QUALITY CONTROL DIVISION
TESTING FORM

EJM DEP

Particulate Field Data Sheet

Client: Hamm				Date: 6-26-86	Page 1 Of 2
Project No.: 86-070-3	Operator: RLH				
Sampling Location: STACK - Perry Co.			Run No.: 1		
Filter No.: 250	Acetone No.:	Condensate: 850			
Barometric Pressure: 29.1	Static Pressure: 1.1	Probe Number: B-3			
Nozzle Diameter: .251	Nozzle Number: 0-25	Pitot Coefficient: .77	Pitot Number: A-5		
Meter Corr. Factor: 1.0026	Meter-Orifice: 790.1				
Sample Pt. Time: 3 minutes	Assumed % Moisture: 35 %	Leak Test: Before .004 @ 15" Hg	After .011 @ 12" Hg		

Orsat Analysis

CO_2	$+O_2$	O_2	CO
4.5	15.5	11.0	
4.7	15.7	11.0	

Sample Point	ΔP	$\sqrt{\Delta P}$	ΔH	Temperature °F: Stack	Probe	Imp. Out	Oven	Meter In	Meter Out	Vac. Pr. (In. HG)	Dry Gas Meter Reading in Cu. Ft.
START 9:10											178.754
A 1	2.1	1.449	3.36	163	294	64	248	84	84	0	181.680
2	2.3	1.516	3.68	164	294	57	243	84	84	0	184.760
3	2.0	1.449	3.36	165	257	50	242	85	85	0	187.780
4	2.0	1.414	3.18	163	193	48	232	86	85	0	190.650
5	1.8	1.341	2.85	163	289	48	237	87	86	0	193.395
6	1.45	1.204	2.28	163	292	50	262	88	86	0	195.900
7	1.2	1.095	1.97	163	294	51	270	88	87	0	198.000
8	1.0	1.0	1.55	160	272	51	270	89	87	0	199.960
B 1	2.4	1.549	3.86	164	270	52	258	89	88	0	203.040
2	2.3	1.516	3.68	164	271	53	251	90	88	0	206.290
3	2.3	1.516	3.68	163	269	53	247	90	88	0	209.280
4	2.0	1.414	3.19	162	272	53	245	91	88	0	212.170
5	1.7	1.303	2.75	163	271	53	239	92	88	0	214.850
6	1.6	1.264	2.58	164	272	53	242	92	88	0	217.425
7	1.4	1.183	2.24	164	272	53	245	92	88	0	219.810
8	1.3	1.14	2.08	165	272	54	245	92	89	0	222.125
C 1	2.3	1.516	3.68	165	272	55	245	92	89	1.0	225.160
2	2.2	1.483	3.57	166	273	54	243	93	89	1.0	228.150
3	1.8	1.341	2.90	165	272	54	244	93	89	1.0	230.840
4	1.8	1.341	2.90	165	271	54	249	94	90	1.0	233.530
5	1.6	1.264	2.56	166	250	54	242	95	90	1.0	236.000
6	1.5	1.224	2.40	165	253	56	236	95	91	1.0	238.300
7	1.5	1.224	2.40	165	251	57	228	96	92	0.	240.630
8	1.4	1.183	2.23	165	250	56	225	96	92	0	243.00
			68.88 ✓								
STOP 10:32		1.329	2.875					2173	2111		
		1.330 ✓	2.8679 ✓	163.95 ✓							64.246 ✓
								89.25 ✓			
		~~31.94~~ 31.929 ✓				silica gel = 16.7					

Pitot Tube Leak Check: Before ok After ok

Integrated Bag Leak Check: Before ok After ok

020580

Oven - C
Impinger - D

Burns & McDonnell
Engineers-Architects-Consultants

AIR QUALITY CONTROL DIVISION
TESTING FORM

EJM
GM

Particulate Field Data Sheet

Client: HAMM				Date: 6-26-86	Page 1 Of 2
Project No.: 86-070-3	Operator: R. Howes				
Sampling Location: STACK near Peoryka			Run No.: 3		
Filter No.: 276	Acetone No.:	Condensate: 725			
Barometric Pressure: 29.1	Static Pressure: 1.1	Probe Number: B-3			
Nozzle Diameter: .251	Nozzle Number: 0-25	Pitot Coefficient: .77	Pitot Number: A-5..		
Meter Corr. Factor: 1.0026	Meter-Orifice: 790.1				
Sample Pt. Time: 3-minutes	Assumed % Moisture: 40 %	Leak Test	Before .005@10" Hg.	After .015@10" Hg.	

Orsat Analysis

CO_2	$+O_2$	O_2	CO
5.8	15.0	9.2	
6.0	15.0	9.0	

START 2:13

Sample Point	ΔP	$\sqrt{\Delta P}$	ΔH	Temperature °F: Stack	Probe	Imp. Out	Oven	Meter In	Meter Out	Vac. Pr. (In. HG)	Dry Gas Meter Reading in Cu. Ft.
											302.500
A 1	2.4	1.549	3.53	165	249	55	253	106	109	0	305.100
2	2.4	1.549	3.53	164	250	53	251	106	109	0	308.000
3	2.0	1.414	2.92	165	243	49	242	106	108	0	310.660
4	1.6	1.264	2.31	166	240	47	236	107	108	0	313.070
5	1.5	1.224	2.16	165	252	47	235	107	108	0	315.400
6	1.4	1.183	2.01	167	242	47	231	107	108	0	317.650
7	1.4	1.183	2.01	166	250	47	237	108	108	0	319.850
8	1.4	1.183	2.01	166	250	47	246	108	108	0	322.050
B 1	2.3	1.516	3.37	167	250	48	238	108	108	0	324.920
2	2.3	1.516	3.37	165	265	48	232	109	108	0	327.900
3	1.8	1.341	2.61	166	267	48	243	109	108	0	330.480
4	1.3	1.14	1.86	167	237	48	253	110	109	0	332.700
5	1.3	1.14	1.86	166	225	49	256	110	109	0	334.900
6	1.2	1.095	1.71	167	256	50	270	110	109	0	337.000
7	1.2	1.095	1.71	168	261	51	274	111	109	0	338.800
8	1.2	1.095	1.71	166	269	52	272	111	109	0	340.800
C 1	2.35	1.532	3.45	166	230	52	265	110	109	0	343.750
2	2.35	1.532	3.45	166	231	52	262	110	109	0	346.980
3	2.2	1.483	3.22	167	282	52	265	109	109	0	349.850
4	2.0	1.414	2.91	167	287	52	267	109	109	0	352.570
5	1.75	1.322	2.53	166	287	53	267	109	109	0	355.000
6	1.6	1.264	2.31	166	265	54	266	110	109	0	357.420
7	1.4	1.183	2.01	167	287	54	259	111	109	0	359.700
8	1.5	1.224	2.16	166	265	55	257	110	109	0	362.000
STOP 3:32		1.310	2.53	166.13				110 / 111	109 / 109		59.5
		31.441						2611 - 2607			
								108			
							92% = f				
							silicagel: 19.8				

Pitot Tube Leak Check: Before ok After ok

Integrated Bag Leak Check: Before ok After ok

2.9 1.5 10.5
Bottom Rear Bottom Rear

0205S80

Burns & McDonnell
Engineers-Architects-Consultants

oven - C
Impinger - D

PLANT DATA SHEETS

Burns & McDonnell
ENGINEERS - ARCHITECTS - CONSULTANTS
Kansas City, Missouri

Client Hamm Asphalt Page ____ Of ____

Project No. 86-070-3 Date 6-26-86 Made By RLH

PLANT OPERATIONAL DATA Checked By ____

Run # 1 Preliminary ____ Final ____

041581 Form GCO-29

Plant Location : Perry Kansas

Plant Model : CMI uDM 1200

FEED RATES	TIMES (15 minutes) 9:15	9:30	9:45	10:00		
VIRGIN MATERIAL tons/Hour	171	171	171	171		
Recycle MATERIAL tons/Hour	114	114	114	114		
Asphalt Cement Flow Rate tons/Hour	7.1 %	7.1 %	7.1 %	7.1		
MIX TEMPERATURE (DEGREES F)	265°	265°	260°	260		
FUEL FLOW RATE				3.28 GAL/TON	1740. T	
WET WASHER (SCRUBBER) PRESSURE DROP (Inches of Water)	2.9" Front 1.5" Back 1.4" H_2O Pressure Drop					
Aggregate Moisture %	VIR - 3.5% REC - 6.%	VIR - 3.5% REC - 6.%	VIR - 3.5% REC - 6.%	VIR - 3.5% REC - 6.%		
Inlet Exhaust Gas Temperature (°F)	310°	310°	310°	310°		

Data Taken By : Randy Jordan

Average Plant production rate 171 virgin matl.
+ 114 recycle matl. (Approx. 40%) Recycle mixture
+ 7.1 asphalt cement
total = 292.1 ton/hour

Burns & McDonnell
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Kansas City, Missouri

Client Hamm Asphalt Page ____ Of ____

Project No. 86-070-3 Date 6-26-86 Made By TLH

PLANT OPERATIONAL DATA Checked By ____

Run #3 Preliminary ____ Final ____

041581 Form GCO-29

Plant Location : Perry Kansas

Plant Model : CMI uDM 1200

FEED RATES	TIMES (15 minutes) 2:15	2:30	2:45	3:00	3:15		
VIRGIN MATERIAL ~~tons~~/Hour	171	171	171	171	171		
Recycle MATERIAL ~~tons~~/Hour	114	114	114	114	114		
Asphalt Cement Flow Rate ~~tons~~/Hour	7.1%	7.1%	7.1%	7.1%	7.1%		
MIX TEMPERATURE (DEGREES F)	275°	265°	250°	255°	250°		
FUEL FLOW RATE						3.28 G/TON	1740.7
WET WASHER (SCRUBBER) PRESSURE DROP (Inches of Water)	2.9 Top ~~Rear~~ Front 10.5 Bottom Rear 1.5 Top Rear		Pressure Drop = 7.6 "H_2O				
Aggregate Moisture %	VIR-3.5% REC-6.%	VIR-3.5% REC-6.%	VIR-3.5% REC.6%	VIR-3.5% REC6.%	VIR-3.5% REC, 5.%		
Inlet Exhaust Gas Temperature (°F)	320°	305°	295°	300°	295°		

Data taken by: Randy Jordan

Average plant production rate = (Approx. 40% Recycle mixture)

171 ton/hr virgin matl
114 ton/hr. recycle matl
7.1 ton/hr. asphalt cement

TOTAL = 292.1 tons/hour

CALIBRATION OF TESTING EQUIPMENT

AIR QUALITY CONTROL DIVISION
TESTING FORM

PRETEST

Dry Gas Meter Calibration Sheet

Client HAMM
Project No. 86-070-3
Module 790.1
Orifice SMALL

Run By R Howe
Date 6-4-96
Barometric Press 29.20

ΔH in. H_2O	Vw initial	Vw final	Vw ft.³	Vd initial	Vd final	Vd ft.³	tw °F	tdi °F	tdo °F	Pw in. H_2O	Time θ min.
.5	5686	5691	5.0	502.668	507.644	4.976	72	73	73	.1	13.1
1.0	5692	5697	5.0	508.627	513.600	4.973	72.5	74	73	.1	9.1
2.0	5698	5703	5.0	514.608	519.560	4.952	73	74	74	.1	6.55
4.0	5704	5709	5.0	520.558	525.520	4.962	73	75	74	.15	4.6
6.0	5710	5720	10.0	526.500	536.400	9.900	73	78.5	74	.18	7.6

ΔH	$\frac{\Delta H}{13.6}$	Mc (Y) $\frac{Vw\ Pb\ (td + 460)}{Vd\ (Pb + \Delta H/13.6)\ (tw + 460)}$	Δ Ha (For Small Orifice Only) $\frac{0.0317\ \Delta H}{Pb\ (td + 460)} \left[\frac{(tw + 460)\ \theta}{Vw}\right]^2$
.5	.0368	1.005	
1.0	.0737	1.001	
2.0	.147	1.006	
4.0	.294	1.000	
6.0	.441	1.001	
Average		1.0026	

ΔH = Orifice Setting
Vw = Volume of Gas of Wet Test Meter
Vd = Volume of Gas of Dry Gas Meter
Pw = Pressure of Wet Test Meter
tw = Temperature of Fluid in Wet Test Meter
tdi = Inlet Temperature of Dry Gas Meter
tdo = Outlet Temperature of Dry Gas Meter
td = Average Temperature of Dry Gas Meter
θ = Time required to pull specified cubic feet
Mc = Dry Gas Meter Correction Factor
ΔHa = Orifice setting that would pull .75 cfm of air at standard conditions

LEAK CHECK OF METERING SYSTEM CALIBRATION

The following leak check was performed as outlined in Section 5-6. The sampling train from the pump to the orifice meter was leak-checked prior to field use and after its field use.

The main valve on the pump was closed off. A piece of rubber tubing was attached to the orifice exhaust pipe. The low side of the orifice manometer was disconnected and vented. The low side of the orifice tap was then closed off. The system was pressurized to 5-7 inches of water column by blowing into the rubber tubing. The tubing was then pinched off and the manometer was observed for one minute. The following are the results of the observation for each meter identification:

Pretest

Meter I.D.	Inches H_2O Column	Leak rate/minute
790.1	6" H_2O	$\leq$ 0.02" H_2O/minute

Post Test

Meter I.D.	Inches H_2O Column	Leak rate/minute
790.1	6" H_2O	$\leq$ 0.02" H_2O/minute

meter Field Calibration (6-25-86) at Plantsite

Initial meter Reading	Final meter Reading	volume	Time	meter Avg Temp.	ΔH setting
160.883	168.512	7.629 $(ft.)^3$	10 minutes	94°F	1.8

$$Y_c = \frac{10}{7.628}\sqrt{\frac{(0.0319)(554)}{29.24}}$$

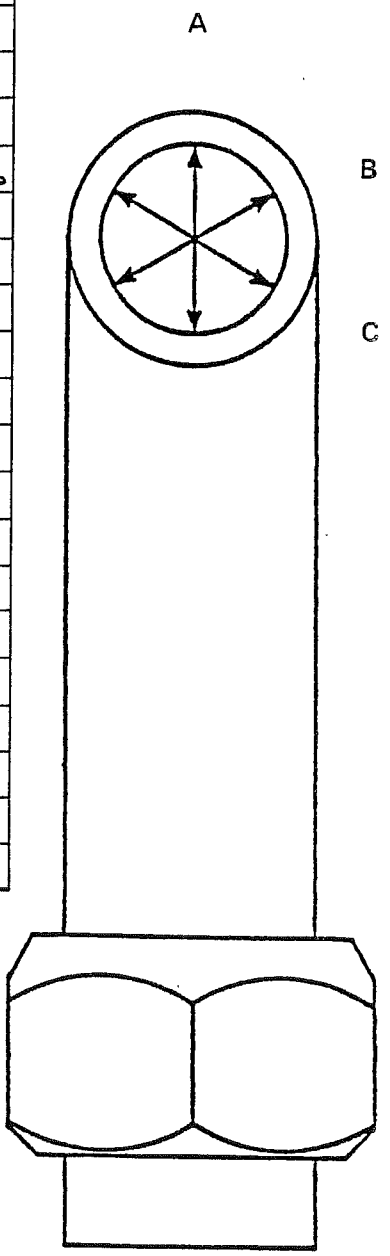
$$Y_c = 1.019$$

AIR QUALITY CONTROL DIVISION
TESTING FORM

Nozzle Calibration

Sized By R.L. Howes

Date	Nozzle	Dimension A	Dimension B	Dimension C	Difference	Avg. Diameter
4-86	A 125					
	B 125	.127	.127	.126	.001	.127
	A 187	.184	.185	.185	.001	.185
	B 187	.185	.186	.187	.002	.186
	C 187	.188	.187	.188	.001	.188
	D 187	.185	.185	.184	.001	.185
	A 250	.249	.249	.249	.000	.249
	B	.253	.253	.253	.000	.253
	C	.250	.251	.251	.001	.251
	D	.251	.251	.251	.000	.251
	E	.254	.253	.252	.002	.253
	F	.251	.250	.249	.002	.250
	G					
	H					
	I					
	J	.248	.248	.248	.000	.248
	K	.248	.247	.246	.002	.247
	L	.248	.249	.249	.001	.249
	M	.246	.248	.247	.002	.248
	N	.255	.253	.254	.002	.254
*	O	.251	.252	.251	.001	.251
	P	.251	.251	.250	.001	.251
	R	.252	.252	.253	.001	.252



All Dimensions are in Inches.

AIR QUALITY CONTROL DIVISION
TESTING FORM

Thermocouple Calibrations

Gas Meter

Client Hamm Asphalt Barometric Press 29.48

Project No. 86-070-3

Thermocouple Identification	Ice Bath		Boiling Water		Thermometer Number	Date
	Trendicator	Thermometer	Trendicator	Thermometer		
Meter ID	°F	°F	°F	°F	ASTM 1f	1-15-86
					277-637	
051 IN	32	32	209	210		
OUT	33	32	210	210		
059 IN	32	33	210	210		
OUT	33	33	210	211		
093 IN	32	34	212	211		
OUT	34	34	212	212		
094 IN	33	32	212	213		
OUT	32	33	212	213		
771 IN	33	34	212	212		
OUT	32	33	212	211		
772 IN	33	33	213	211		
OUT	33	34	211	210		
773 IN	32	33	212	211		
OUT	33	34	210	209		
774 IN	34	34	209	209		
OUT	33	34	209	208		
789 IN	32	33	209	209		
OUT	32	33	210	209		
* 790 IN	33	33	210	210		
OUT	33	34	209	210		

AIR QUALITY CONTROL DIVISION
TESTING FORM

Thermocouple Calibrations

Probe

Client Hamm Asphalt Barometric Press 29.52

Project No. 86-070-3

Thermocouple Identification	Trendicator	Thermometer	Thermometer Number	Date
		ASTM-	227-627	2-26-86
PROBE A-3	258	257		
* B-3	260	255		
C-3	260	259		
A-5	255	256		
B-5	258	258		
C-5	263	261		
D-5	255	254		
E-5	253	252		
S-5	252	252		
A-7	267	266		
B-7	270	271		
A-10	276	275		
B-10	252	254		
C-10	263	263		
D-10	273	275		
E-10	270	[illegible]		
F-10	273	272		
A-15	277	276		
B-15	272	270		
C-15	275	276		
D-15	264	266		
A-20	271	270		
B-20	267	267		

AIR QUALITY CONTROL DIVISION
TESTING FORM

Thermocouple Calibrations

Impinger

Client Hamm Asphalt Barometric Press 29.43

Project No. 86-070-3

Thermocouple Identification	Ice Bath		Boiling Water		Thermometer Number	Date
	Trendicator	Thermometer	Trendicator	Thermometer		
Impinger ID					ASTM 1f	2-20-86
					227-637	
A	33	33	212	212		
B	32	32	210	211		
C	32	33	212	212		
* D	33	33	210	211		
E	32	33	212	213		
F	33	32	211	212		
G	33	32	210	211		
H	31	32	212	212		
I	32	32	211	213		
J	33	34	212	212	"	"

LABORATORY REPORTS

Analytical Data Sheet

Client HAMM Project No. 86-070-3 Date 6-30-86

Run No. 1
Filter No. 250
Acetone No. 193
Amount liquid lost during transport -0-
Acetone blank volume, ml 200 ml.
Acetone wash volume, ml 220 ml.
Acetone blank concentration, mg/mg (equation 5-4)** .6 mg(200ml) = .003 mg/ml.
Acetone wash blank, mg (equation 5-5)** .003 mg/ml x 220ml = .66 mg/ml.
oz .0007 grams

Container Number	Weight of Particulate Collected, g		
	Final Weight	Tare Weight	Weight Gain
250 1	142.0030	141.9257	.0773
193 2	52.6609	52.6364	.0245
Total			0.1018
		Less acetone blank —	0.0007
		Weight of particulate matter	0.1011

	Volume of Liquid Water Collected		
	Impinger Volume, ml.	Silica Gel Weight, g	
Final	1350	366.7	
Initial	500	350	
Liquid Collected	850	16.7	
Total Volume Collected	866.7	g*	ml

Run No. 2
Filter No. 271
Acetone No. 42
Amount liquid lost during transport -0-
Acetone blank volume, ml 200 ml.
Acetone wash volume, ml 250 ml.
Acetone blank concentration, mg/mg (equation 5-4)** .6 mg(200ml) = .003mg/ml.
Acetone wash blank, mg (equation 5-5)** (.003mg/ml) x 250ml = .75 mg/ml.
oz .0008 grams

Container Number	Weight of Particulate Collected, g		
	Final Weight	Tare Weight	Weight Gain
271 1	135.0661	134.9954	.0707
42 2	61.9208	61.9024	.0184
Total			0.0891
		Less acetone blank —	0.0008
		Weight of particulate matter	0.0883

	Volume of Liquid Water Collected		
	Impinger Volume, ml.	Silica Gel Weight, g	
Final	1280	369.9	
Initial	500	350	
Liquid Collected	780	19.9	
Total Volume Collected	799.9	g*	ml

*Convert weight of water to volume by dividing total weight increase by density of water (1g/ml): $\frac{\text{Increase, g}}{\text{1g/ml}}$ = Volume Water, ml

**See Federal Register, Method 5, 6.6 & 6.7.

MARSHALL TEST RESULTS

JG original

(Redid Apr. 24, 1986)

Lab. No. 1-86-2045

Date Received: APRIL 14-86

Date Reported: APRIL 18-86

Project No. 59-44 K0403-01 Material Type Bit. RECYCLE

Field Engineer S. TOMMER Contractor N.E. HAMM COR.

Specification 807-50R2 Sampled From

Asphalt Source SHELL Grade VAC-20

Sieve Size	1"	3/4	1/2	3/8	4	8	16	30	50	100	200
Job Mix Spec. Band											
Job Mix Single Pt.	~~Virgin Aggs~~	0	12	27	54	63	69	79	94	99	99
Marshall Gradation	"	0	12	27	54	63	69	79	94	99	99

Test Procedural Data

Range % Asphalt	% Increments of Asphalt	Asphalt Mixing Temperature Range	Molding Temperature Range
1.74 to 2.71	0.25 ~~0.2675~~	Spec. 304° to 316°	283° to 292°
		Actual 309° to 314°	285° to 290°

Marshall Design Only | Plant Operation Range | Marshall Design & Field Density Plugs.

1.75 2.00 % ASPHALT CONTENT 2.50 2.75

VMA 15 %	14.96	14.24	14.35	14.19	14.19
% Air Voids 3 to 5	7.18	6.83	5.24	4.56	4.56
% VFA 70%	52.01	55.70	62.17	64.98	66.98
Bearing Capacity 100-300	337	308	303		301
Weight Per Cubic Foot peak ±0.5%					147.57
Stability	1100	3325	3376	3246	33.46
Theoretical Max. Den.	2.501	2.501	2.488	2.478	2.478

$P_{b'max}$ = 3.1 %

Recommended % Asphalt 2.50

Note - Show values at Recommended Asphalt Content

cc: Field Engineer (2)
District Engineer
Bureau of Construction & Maintenance
Bureau of Materials & Research (2)
Materials & Research Center (2)

(Analysis by total weight of mix)

Project 59-44K0403-01 Date April 18-86 Lab. No. 1-86-2045

		1.75	2.00	2.25	2.50	2.75			
% AC by weight of Dry Aggregate		4.708	4.965	5.222	5.480	5.737		P'_b	Eq.
% AC by weight of total mix	a	4.50	4.73	4.96	5.19	5.43		P_b	
% Aggregate by weight of total mix	b	95.50	95.27	95.04	94.81	94.57		P_s	
Sp. Gravity of AC	c	1.040	1.039	1.037	1.039	1.038		G_b	
Bulk Dry Sp. Gr., total aggregate	d	2.613	2.613	2.613	2.613	2.613		G_{sb}	1
Max. Sp. Gr., paving mix (KT-39)	e	2.507	2.504	2.488	2.478	2.472		G_{mm}	3
Bulk Sp. Gr., compacted mix (KT-15)	f	2.321	2.333	2.355	2.365	2.369		G_{mb}	
Effective Sp. Gr., total aggregate	g	2.685	2.685	2.685	2.685	2.685		G_{se}	2
Absorbed Asphalt, % by weight of agg.	h	1.07	1.07	1.07	1.07	1.07		P_{ba}	4
Effective Asphalt Content, %	i	3.48	3.71	3.94	4.18	4.42		P_{be}	5
VMA, %	j	14.96	14.94	14.35	14.19	14.26		VMA	6
Air Voids, % by vol. of compacted mix	k	7.18	6.83	5.34	4.56	4.16		P_a	7
Voids Filled with Asphalt, %	l	52.04	55.76	62.23	67.05	70.94		VFA	8

$$a = \frac{P'_b \cdot 100}{100 + P'_b}$$

$$b = 100 - a$$

$$g = \frac{b}{\frac{100}{e} - \frac{a}{c}}$$

$$h = 100\,\frac{g - d}{d \cdot g} \cdot c$$

$$i = a - \frac{h}{100} \cdot b$$

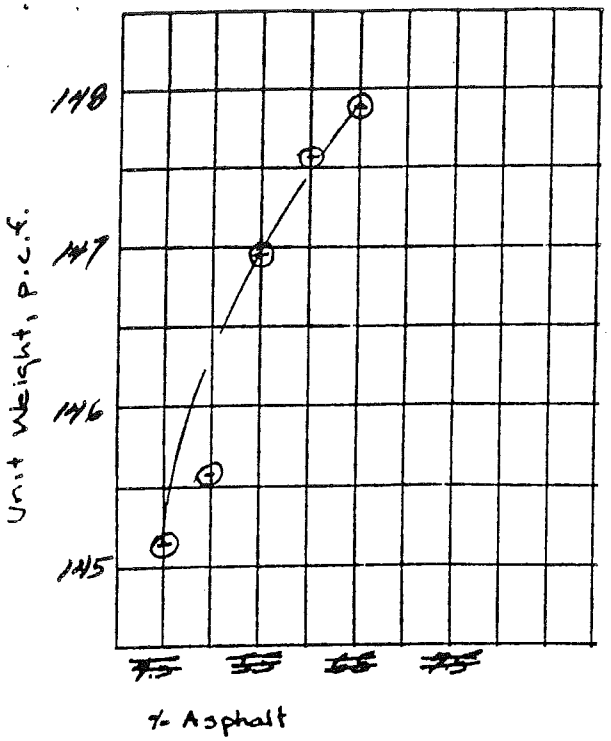
$$j = 100 - \frac{f \cdot b}{d}$$

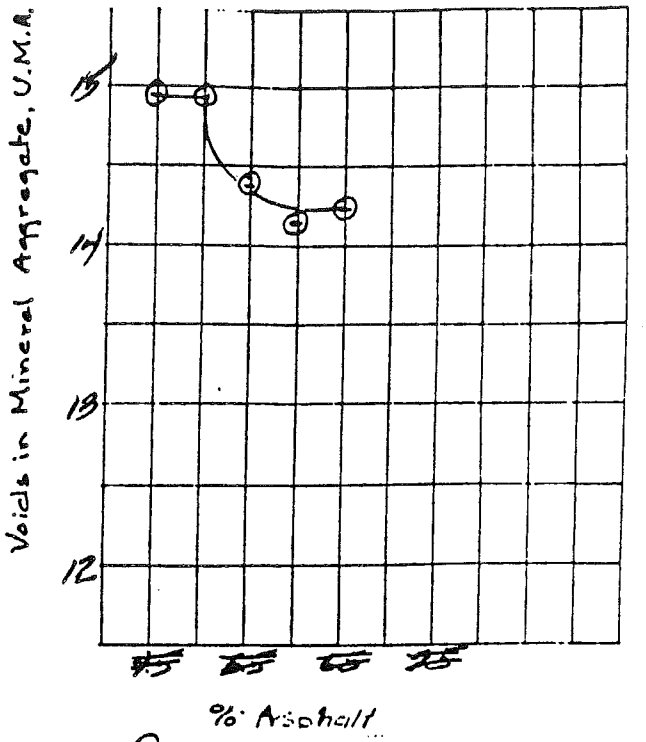
$$k = 100\,\frac{e - f}{e}$$

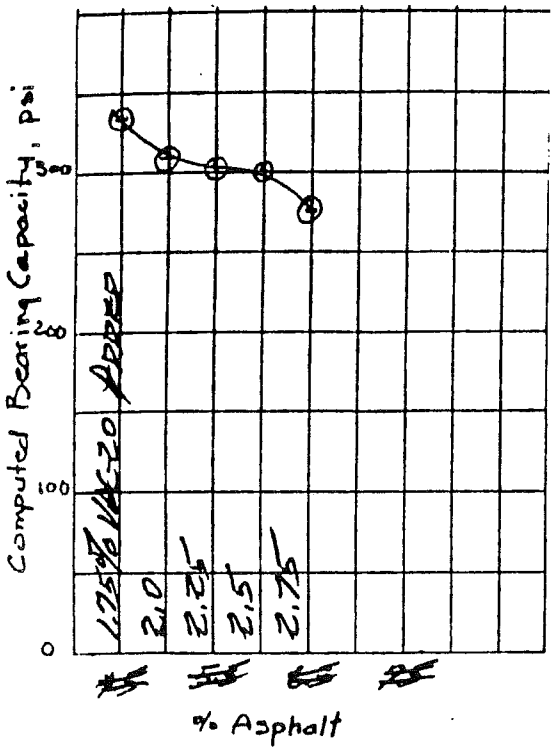
$$l = \frac{100\,\frac{1}{c}}{j}$$

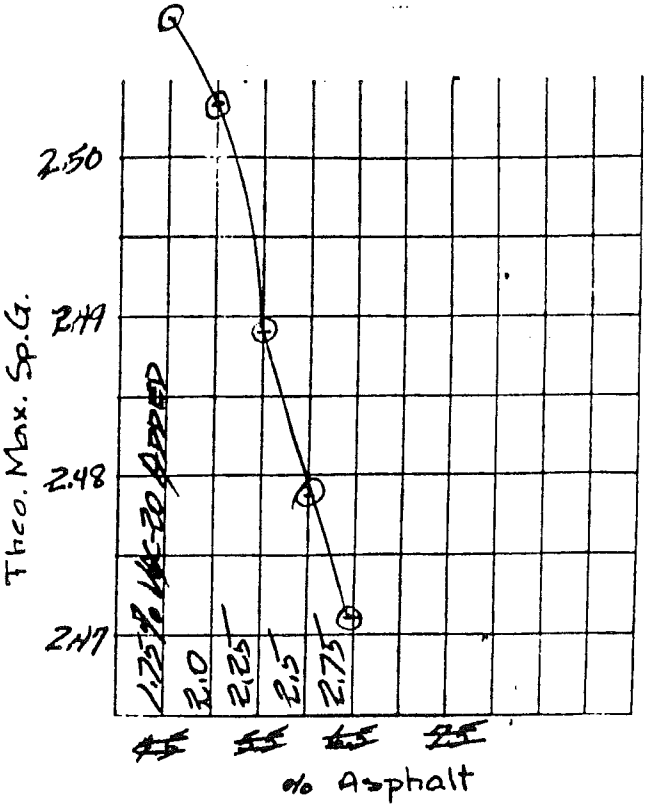
Constituent Material	Specific Gravity	App.	Bulk	Mix Composition %	Dry Agg.
1. +#4	G_1		2.56	P_1	54
2. -#4 +#30	G_2		2.58	P_2	25
3. -#30	G_3	2.62		P_3	21
4. Min. Filler	G_4			P_4	
5. Asphalt	G_5			G_{sb}	

1-86-2043


Unit Weight, p.c.f.
148
147
146
145
% Asphalt


Voids in Mineral Aggregate, V.M.A.
15
14
13
12
% Asphalt


Computed Bearing Capacity, psi
300
200
100
0
ADDED
2.0
2.25
2.5
2.75
% Asphalt


Theo. Max. Sp.G.
2.50
2.49
2.48
2.47
ADDED
2.0
2.25
2.5
2.75
% Asphalt

THEORETICAL MAXIMUM SPECIFIC GRAVITY OF BITUMINOUS PAVING MIXTURES

References: ASTM D2041-78 (Rice's method) and Kansas Test Method KT-39-80 (Proposed)

Project 59-44K0403-01 Date April 18-86 Lab. No. 1-86-2045

Sample No.		2.0	2.25	2.50		
Mass of Sample + Flask in Air, gm.		2932.0	2970.6	2983.0		
Mass of Flask in Air, gm.		1326.2	1326.2	1326.2		
Mass of Sample in Air, gm. A		1605.8	1644.4	1656.8		
Temp. of Bath, Sample and Flask after 10 min.		77°	77°	77°		
Mass of Sample + Flask in water, gm.		1695.1	1714.1	1718.6		
Mass of Flask in water, gm. (from calibration graph)		730.4	730.4	730.4		
Mass of Sample in water, gm. C		964.7	983.7	988.2		
Maximum Sp. Gr. of Mix (Rice's) $\frac{A}{A-C}$		2.504	2.488	2.478		

KANSAS DEPARTMENT OF TRANSPORTATION

COMPUTATION SHEET Sheet ____ of ____ Sheets

Project 59-44 K0403-01 LAB. No. 1-86-2045 County JEFF.

Type of Work BIT. RECYCLE Subject ____ Change in Plans No. ____

Surface Area:

Sieve Size	#4	#8	#16	#30	#50	#100	#200	
% Retained	44	58	67	76	89	92	94	
% Pass	56	42	33	24	11	8	6	
SA Factor x	.02	.04	.08	.14	.30	.60	1.60	
0.00 +	1.12	1.68	2.64	3.36	3.30	4.80	9.60	= 28.50

BITUMEN INDEX ($\times 10^{-3}$) = $\frac{P_{be}}{S.A.} \times 10 = \frac{3.94}{28.50} \times$ 1.38

FILM THICKNESS (FT) = BITUMEN INDEX × 4.87 1.38 × 4.87 = 6.72

$VF_{ba} = \frac{(P_{ba})(G_{sb})}{G_b}$ (VOL. ABSORB. ASPH.) $\frac{1.07 \times 2.613}{1.039} = 2.69$

$TSV = VMA + VF_{ba} - 2.0$ (TOTAL SAFE VOL.) 14.35 + 2.69 - 2.0 = 15

$P_{b\,MAX} = \frac{TSV(G_b)(0.9638)}{G_{sb}} = \frac{15.04(1.039)(0.9638)}{2.613} = 5.76$

$P'_{b\,MAX} = \frac{(P_{b\,MAX})(100 + P_{b\,MAX})}{100} = \frac{(5.76)(100+5.76)}{100} = 6.09$

Calc - 20% ALL

QUALITY ASSURANCE

AIR QUALITY CONTROL DIVISION
TESTING FORM

Chain of Custody

Client	Project No.	Plant Name
Hamm Asphalt	86-070-3	Hamm
Laboratory	**Type of Sample**	**Sampling Location**
B+McD Lab.	Filters & Acetone rinses	Perry Ks. (STACK)

Run No. 1	Run No. 2	Run No. 3
Filter No. 250	Filter No. 271	Filter No. 276
Acetone No. 193	Acetone No. 42	Acetone No. 104
Sample Recovery:	Sample Recovery:	Sample Recovery:
By S. Waisner	By S. Waisner	By S. Waisner
Date 6-26-86	Date 6-26-86	Date 6-26-86
Samples received in laboratory:	Samples received in laboratory:	Samples received in laboratory:
By R. Howes	By R. Howes	By R. Howes
Date 6-27-86	Date 6-27-86	Date 6-27-86
Samples handled in laboratory:	Samples handled in laboratory:	Samples handled in laboratory:
By R. Howes	By R. Howes	By R. Howes
Date 6-27-86	Date 6-27-86	Date 6-27-86
Time 1:00 PM	Time 1:00 PM	Time 1:00 PM
Laboratory Report received:	Laboratory Report received:	Laboratory Report received:
By R. Howes	By R. Howes	By R. Howes
Date 6-30-86	Date 6-30-86	Date 6-30-86

Comments: